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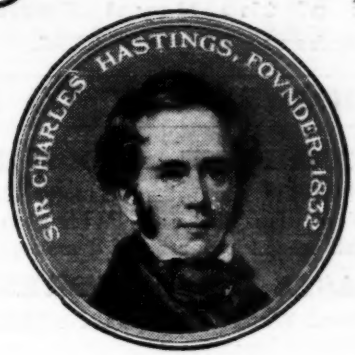

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DISEASES OF CHILDREN.

From July 16th to August 3rd at the Royal Waterloo Hospital for Children and Women. Instruction will be given every afternoon by members of the Staff in all departments.

From September 3rd to September 29th at the Infant's Hospital Lectures and demonstrations will be given by the Director (Dr. ERIC PRITCHARD) and members of the Staff every afternoon from 2 to 6 p.m.

DERMATOLOGY.

From July 16th to July 28th at the Hospital for Diseases of the Skin, Blackfriars. Daily instruction will be given in the Out-Patient Department every afternoon with a special clinical demonstration each week and a V.D. Clinic on Tuesday and Friday from 5.30 to 7 p.m.

From September 17th to October 13th at St. John's Hospital for Diseases of the Skin. Special Demonstrations by members of the Staff every morning and afternoon during the whole period.

OPHTHALMOLOGY.

From July 30th to August 25th at the Royal Westminster Ophthalmic Hospital. Clinical instruction will be given every afternoon with special demonstrations on Monday, Tuesday and Wednesday mornings from 10 a.m.

From September 3rd to September 29th at the Central London Ophthalmic Hospital. Classes will be given in the use of the Ophthalmoscope and external diseases of the eye in addition to clinical demonstrations in the afternoons.

Members of the Staffs of the London Medical Schools will give lectures and demonstrations in connection with the various Courses to be held at the Post-Graduate Hospitals, of which particulars will be issued later.

Other Courses have been arranged as follows:—

OCTOBER.		
General Medicine and Surgery	Oct. 8th—20th	London Temperance Hospital and others.
Cardiology	„ 15th—28th	National Hospital for Diseases of the Heart.
Children's Diseases	„ 8th—27th	Victoria Hospital for Children.
Dermatology	Oct. 29th—10th Nov.	Hospital for Diseases of the Skin, Blackfriars.
Disease of the Ear, Nose and Throat	Oct. 8th—27th	Central London Throat, Nose and Ear Hospital.
Genito-Urinary Diseases	„ 1st—27th	St. Peter's Hospital.
Ophthalmology	Oct. 8th—3rd Nov.	Royal London Ophthalmic Hospital.
Proctology	Oct. 15th—27th	St. Mark's Hospital.
Tropical Diseases	„ 2nd—26th	London School of Tropical Medicine.
NOVEMBER.		
General Medicine and Surgery	Nov. 5th—17th	Royal Northern Hospital and others.
Children's Diseases	Nov. 12th—8th Dec.	"Children's Clinic," Western General Dispensary.
Gynæcology	Nov. 5th—30th	Chelsea Hospital for Women.
Ophthalmology	Nov. 19th—15th Dec.	Royal Westminster Ophthalmic Hospital.
Psychological Medicine	Nov. 5th—30th	Maudsley Hospital.
Venereal Disease	„ 5th—30th	London Lock Hospital.
DECEMBER.		
General Medicine and Surgery	Dec. 3rd—15th	Hampstead General Hospital and others.
Dermatology	„ 3rd—22nd	St. John's Hospital for Diseases of the Skin.
Neurology	„ 3rd—22nd	Hospital for Epilepsy and Paralysis.

In November and December lectures on the following subjects will be given by teachers from the Medical Schools: Diseases of the Ear, Nose and Throat, Gynæcology, Orthopædics, Suggestion Treatment, Vaccine-therapy, Venereal Disease, etc.

All members of the Fellowship are entitled to receive a copy of the Bulletin, published monthly, which gives full information as to the time of visits and operations of the several physicians and surgeons in the Medical Schools of London.

Further particulars as to the fees, etc., of the various courses may be had on application to the Secretary to the Fellowship of Medicine at the above address.

HERBERT J. PATERSON, M.C.
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THE

British Medical Journal.

THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION.

LONDON: SATURDAY, JULY 7TH, 1923.

A British Medical Association Lecture

ON

THE EXPERIMENTAL INQUIRY INTO THE CAUSES OF CANCER.*

BY

ARCHIBALD LEITCH, M.D.,

DIRECTOR OF THE CANCER HOSPITAL RESEARCH INSTITUTE, LONDON.

Αιτίην δὲ ἀρρεκέα μὲν ἴσασι μοῦνοι θεοί, ἐοικυῖαν δὲ καὶ ἄνθρωποι.—ARETAEUS.

WITH so much known of the actual manifestations of tumour growths, and with their antecedents so obscure, it is little wonder that speculation regarding the causation of cancer has so long held its sterile and unprofitable way. The gossamer fancies of the armchair philosopher need scarcely a breath of criticism for their destruction; and as for the theories of the greater thinkers, the outcome of much experience carefully interpreted, we may for the present adopt the dialectical strategy of Hegel and say that possibly they all represent partial and different aspects of the truth. Anxious as we should be, in view of the poverty of our knowledge, to avoid bound allegiance to any theory, we cannot wholly dispense with working hypotheses, and the recent experimental investigations have been born of the idea that cancerous growth is the result of some long-continued irritation. That is the oldest theory of them all. The ancient Greek physicians imagined that cancer, as well as many other diseases, was due to the irritating and acrid properties of the black bile. Are there not some to-day who attribute to intestinal stasis, a notion not less nebulous, a similar wide-embracing rôle?

Virchow, the father of modern pathology, contended that tumours were caused by irritation of a chemical or physical nature, not further defining or particularizing, for there had not then accumulated the imposing list of special agents that we now know to be closely associated with the production of cancer. His was a theory that anticipated the evidence. Probably we shall find—our experiments point that way—that few of the substances which we might call tissue irritants are capable of inducing tumour growth, just as out of the myriads of kinds of bacteria there are relatively few which are definitely pathogenic.

These specific irritants, or carcinogenic† agents, as far as we know them, require a prolonged time to work their effects, and they appear to be selective in that certain animal species, certain strains, certain individuals, and certain tissues only are vulnerable to their operation. In the human subject we have the well known instances of the cancer of the scrotum to which chimney-sweeps and labourers in the tar, pitch, and paraffin industries are specially prone; the cancer of the urinary bladder in dye-workers and in the victims of bilharziasis; the epithelioma of the abdomen and thighs in natives of Kashmir; the multiple skin cancers in those who have taken arsenic medicinally over long periods; and the epithelioma of the hands in *x*-ray operators. These and several others seem to show a very intimate relation between particular irritants and tumour formation, but several considerations have long stood in the way of establishing a direct causal connexion between them.

Comparatively few of the subjects exposed to the action of soot, tar, paraffin, aniline dyes, and the rest develop malignant tumours; even those who become affected have been in contact with the noxious substances for many years: more arresting still is the fact that several of these workers have retired from such occupations and yet, years afterwards, have developed the same peculiarly localized cancers. Considering, too, the numerous instances of malignancy supervening on other chronic lesions, and the fact that the so-called irritation cancers are so rare in comparison with the large numbers of tumours arising without the intervention of any known or suspected irritant, we have had to admit that our carcinogenic agents might only be the mediate and not the proximate causal factors of the disease. All that we could claim for them was that they brought about a pathological state of the tissues, on which prepared soil the undetermined cancer germ or virus or influence might then exert its action.

Sometimes, however, the progression of events was so uninterrupted—as, for example, in arsenic cancer, where skin hypertrophy merges into wart formation and warts insensibly into epithelioma—that it was difficult to point to any particular time when one factor could give place to another. But no amount of argument could settle the matter. No one had ever produced cancer experimentally by the use of any of the implicated irritants. Of course, numerous claims to have done so by the injection of this or that parasite have been put forward. Let us not resurrect them. The silent records, too, of our laboratories contain many a failure that we have not liked to parade. But a new era dawned on cancer research when Johannes Fibiger of Copenhagen presented his brilliant experiments on the production of gastric cancer in rats. Then for the first time could it be said that cancer had been produced experimentally beyond all doubt, and explorations into the etiology of cancer became practical problems.

SPIROPTERA CARCINOMA.

While examining the bodies of three rats that had been inoculated with tubercle bacilli Fibiger found in each case a cancer of the fundus of the stomach. Such a thing had never before been seen in the rat, though scores of thousands of these animals had been examined for tumours. Malignant new growths do exist in rats, about once in a thousand cases, but cancer of the stomach had never been observed. Fibiger at once endeavoured to propagate the tumours by inoculation of fragments into other rats, and failed. Fresh rats were fed with other pieces of the tumour; nothing happened. Another batch was put in the cages previously occupied by the infected rats; they remained unaffected. Microscopic investigation of the gastric tumours showed them to be epitheliomata, for the cardiac half of the rat stomach is lined with squamous epithelium, and amongst the epithelial cell masses there were round spaces sometimes containing a peculiar structure that suggested sections of an animal parasite. Tracing

*Delivered before the Nottingham Division of the British Medical Association, January 24th, 1923.

† From *καρκίνος*, a tumour, simple or malignant, and *γεννάω*, to produce. Such adjectives as cancrigenic, cancrogenic, and cancerigenic, which have been used by others, are hybrids to be avoided.

SAB

these through hundreds of serial sections, and reconstructing the pictures, he found he was dealing with a nematode, and subsequent dissection of a preserved portion of the tumour enabled him to obtain an entire worm of a species hithero unknown, to which he afterwards gave the name of *Spiroptera neoplastica*.

Observe the conjunction of facts: three rats in one batch, each with cancer of the stomach and in each tumour the same parasites; cancer of the rat's stomach never seen before; a nematode till then unknown. What was the relation between the nematodes and the tumours? A mere accidental coincidence, many would have said, and dismissed it. A probable predisposing cause in these particular cases would have been accepted by the majority. Had Fibiger stopped there he would have made merely an interesting contribution to the literature of our subject, and cancer research might still be the fettered Andromeda of pathology. He killed and examined carefully over a thousand rats, but failed to find either a gastric lesion of any importance or the particular nematode he sought for. Reading the literature of animal parasites, he learned that Galeb had been able to obtain nematodes in the stomach of some rats by feeding them on the common cockroach, *Periplaneta orientalis*, which was infested with another stage in the life cycle of these parasites, and thinking this might be a possible clue he examined rats from a locality in Copenhagen where such cockroaches abounded, but without success. Then he fed fresh laboratory rats on these cockroaches, and again nothing resulted. But finally, when the sustaining hope was almost gone, he heard of a large sugar refinery in the town, where both rats and cockroaches swarmed. The cockroaches here were of a different kind; they were *P. americana*, uncommon in Northern Europe. An examination of the rats revealed many cases of gastric tumours, and in them the long-sought-for nematode was found. A false clue, and a stroke of fortune that was bravely deserved, led him to the great discovery. These cockroaches had come in consignments of sugar from the West Indies; in their muscles were the coiled-up larvae of the nematode, and when the cockroaches were eaten by the rat the larvae were set free and developed in the stomach into the adult nematode. Here, after a time, it produced eggs, which were evacuated with the faeces, eaten by the cockroach, and the larval stage again produced, and so the cycle went on. By feeding other species of cockroaches on the eggs Fibiger succeeded in getting these to serve as intermediary hosts, and thus he obtained his source of supply of spiropterae. By feeding laboratory rats on such artificially infested cockroaches, or on the larvae isolated from their muscles, he induced gastric epithelioma in over 50 per cent. of them.

The freed larva burrows superficially in the gastric epithelium, and there develops to maturity. In some cases no change takes place in the stomach, but in most instances the epithelium begins to proliferate and forms papillomatous projections, and sooner or later the proliferating cells penetrate the muscular coats and reach the peritoneal covering. The nematode may also lodge in the epithelium of the tongue, producing glossitis, leucoplakia, and finally cancer. Strangely enough, though the worms may inhabit the oesophagus they have never been found to induce more than papillary hyperplasia in that situation. In no other portion of the alimentary tract do the parasites lodge or produce neoplasms. Metastases have occurred in several cases in the lungs or lymphatic glands, but from these secondary tumours the parasites were absent. Having once started malignant proliferation, probably by the prolonged toxic action of some excretion, the parasites are no longer essential to the continued growth of the tumour. The parasite may be transferred to wild rats and to other rodents, but in no case has cancer resulted. There are thus species, strains, and particular tissues which are insusceptible to the action of the nematode. Mice are relatively insusceptible, only about 5 per cent. developing gastric tumours; but whilst cancer may be produced in rats in six weeks to three months it takes many months—perhaps over a year—to induce it in mice.

I have given the merest outline of Fibiger's researches—epoch-making, patiently pursued, and brilliantly executed. He was the first to furnish us with a means of producing cancer experimentally at will with a definite agent. He is the pioneer in the experimental inquiry into the etiology of cancer, and I should like, as a humble follower, to pay him my tribute. To my mind, Fibiger's work has been the greatest contribution to experimental medicine in our generation. He has built into the growing structure of truth something outstanding, something immortal, *quod non imber edax possit diruere*.

CYSTICERCUS SARCOMA.

The greatness of Fibiger's achievement stands out in relief when we reflect on the mass of information we had at our disposal regarding another and commoner parasite which is associated with tumour formation, and which, had our eyes been alight, we might have utilized. In examining the bodies of laboratory rats it is no uncommon thing to find cysts of the liver, sometimes single, sometimes in large numbers, filled with clear mucoid fluid and containing a triangular-headed parasite with flattened segmented body—the *Cysticercus fasciolaris*, the larval stage of the *Taenia crassicollis* which affects the cat. Less frequently these cysts may be situated in the omentum, kidneys, or other abdominal organs. Several observers, notably Borrel in 1906, Regaud in 1907, Bridré in 1909, and McCoy in the same year, had described sarcoma of the liver of rats occurring around these parasitic cysts. Bullock and Rohdenburg in America made careful histological studies of several such sarcomata. Histologically the tumours are all of the same nature—spindle-cell sarcomata often highly vascular with a tendency to the formation of large multinucleated cells—and they arise from one or more parts of the compressed connective tissue constituting the wall of the cysts. Borrel and others were able to transplant these sarcomata, and there is no doubt about their true nature.

There are several highly suggestive features about these tumours. Of all the cases of tumours that have been reported in rats, well over a hundred in number, no less than four-fifths have been sarcomata; more than half of these sarcomata have been situated in the liver; and there they have practically always been found around a cysticercus-containing cyst. But it was not until 1917 that any attempt was made to produce sarcoma experimentally by means of the worms. In that year, when reporting a spontaneous case, Hirschfeld, instigated undoubtedly by Fibiger's work, stated that he had instituted feeding experiments on rats with the ova of *Taenia crassicollis*, but as no later communication on the subject came from this author's pen we may assume that his experiments failed. Bullock and Rohdenburg in 1920 were successful. To a very large number of rats they administered by mouth on a single occasion the ova of the adult worm obtained from the faeces of an infested cat. Certain strains of rats, and especially old rats, proved quite insusceptible, but in the majority of young rats the larvae reached the liver and formed cysts, and in about a quarter of the number of such animals sarcoma developed on the cyst wall. Usually only one sarcoma was produced, though there might be dozens of cysts, but in a few cases two independent sarcomata were found. Metastases occurred in about 60 per cent. of the cases. There is a long latent period in the development of these liver sarcomata—eight to fifteen months or more elapse after the ingestion of the ova before the sarcoma starts, but once started it develops with great rapidity. This peculiar feature in the experimental production of sarcoma—the prolonged latent period followed by explosive growth—has struck me in my experiments with paraffin oils and has been noted by Russell in his tar experiments on rats. Possibly we may find it characteristic of sarcoma in general.

Schmidt-Jensen of Copenhagen has failed to produce cysticercus sarcoma in rats, so that there are probably strains of rats that are refractory to this tumour-producing agent. It is presumed that the toxic products of the cysticercus furnish the necessary constant tissue irritant; but however that be, a susceptible tissue is required. The same parasite is commonly found in the liver of mice, but sarcoma of the liver has never been reported in the mouse save in one doubtful case, and neither in that nor in the epithelial tumours of the liver, some thirty in number, could any parasite be discovered.

TAR CANCER.

Workmen constantly exposed to coal-tar and pitch, such as retortmen at gasworks, road sprayers, and briquette makers, are liable to develop skin cancers. This has long been known, and, believing that tar contained some ingredient which directly influenced the tissues to become cancerous, pathologists first used this substance in their endeavours to produce cancer experimentally. Doubtless more numerous attempts were made than the few on record, but they all failed, and the direct relation suspected could not be established. The reasons of those failures are now fairly obvious: either we did not employ suitable animals or our patience was exhausted before results were possible.

Inspired by the success of Fibiger's experiments, two Japanese workers, Yamagiwa and Ichikawa, renewed the attempts. They applied coal tar every other day for several months to the ears of rabbits, and claimed to have produced epitheliomata. While it is probable that many of the epithelial proliferations which they induced would not be recognized as true malignant tumours by the critical, yet the evidence in favour of the malignancy of some, especially the finding of lymphatic gland metastases, must be accepted. I repeated their experiments two years ago on twenty rabbits, applying the tar to the skin between the shoulders, and though in all cases I obtained multiple horny papillomata, commencing in about ten weeks and reaching in some cases the size of acorns, they never became malignant; indeed, the surprising thing was that the tumours tended to diminish in size in spite of the continuance of the tar applications, and in one or two instances entirely disappeared. Possibly Yamagiwa employed a more susceptible strain of rabbits, but more probably the tar he used was more potent. Deelman, Moeller, and Teutschländer have also failed to produce tar cancer in rabbits.* Tsutsui, a pupil of Yamagiwa, discovered that the mouse was the animal of choice; amongst 67 mice which had survived the tar applications for over a hundred days, he found that 35 developed tumours, 16 of which were epithelioma and 1 sarcoma; two of the epitheliomata metastasized to the lungs.

When, after the war, these results became known to us in Europe, it was evident that we were provided with a means not only of producing tumours *de novo*, but also of studying the phenomena of their onset and development. Fibiger and Bang were the first to publish corroborative experiments, soon to be followed by the various other members of our international society—the Leeuwenhoek Vereeniging. In the short space of time that has elapsed, scarcely more than two years, since our Danish colleagues presented their preliminary observations, very many experiments have been done with this one irritant. If tar be applied repeatedly, say thrice weekly, to the skin of mice the hair is lost, at first temporarily, but in the course of time permanently, the skin becomes rough and scaly, and after the lapse of three to six months or more tiny warts, single or multiple, make their appearance, and, increasing gradually in size, form excessively cornified upstanding papillomata with branching vascularized stalks of connective tissue. By and by the epithelium commences to grow downwards into the dermis, the cells become more atypical, the panniculus carnosus is penetrated, and metastatic deposits may be found in the lymphatic glands or in the lungs. The malignant stage is not generally apparent before six months at the earliest. Sometimes the malignant epithelioma is not preceded by preliminary simple wart formation: a minute superficial ulcer may mark the commencement of the epithelial downgrowth, and subcutaneous induration may be the first sign apparent of a neoplastic reaction. In the case of mice almost all develop tumours in response to the tar applications, and in practically all of these one of the papillomata, seldom more, becomes an epithelioma sooner or later. Very few of those that live more than eight months escape without tumour formation. But there are considerable differences as regards the length of time that may elapse before tumours are evident and great variations in the rate of progress of the tumours. The first papilloma to appear is not necessarily the earliest to become malignant.

Given the fact that repeated applications of tar to mice result in the production of epitheliomata in a large proportion, we first addressed ourselves to the consideration of the specificity of the irritant. Did it merely induce a chronic inflammation, a non-specific lesion, on which a malignant process, attributable to some mysterious added cause, was prone to develop? The question is not yet answered. Employing exactly the same technique as in the case of mice, I tried the effects of the tar on several series of rats for periods of more than a year. The rat's skin is more sensitive than that of the mouse, and it does not tolerate the applications so well; the area painted shows the same changes that we find in mice, but I have never succeeded in producing in rats any papillomatous or epitheliomatous formation. The same failure has attended the experiments of others. On the other hand, Russell, by injecting tar in lanoline subcutaneously into rats, has produced sarcoma in two or three cases; it is the fibrous connective tissue and not the epithelium of the surface that responds to the action of tar in this animal. I have similarly applied tar to the skin of a batch of guinea-pigs for two years now, but in no instance have I produced any epithelial proliferation whatever. The experiments with rabbits have already been mentioned. We are thus impelled to the conclusion that, just as in the case of pathogenic bacteria, only certain animal species are responsive to the action of the pathogenic agent, and probably only certain tissues. But this is, after all, only an indirect and partial reply to the question.

The next point that interested us was, given this active agent and a responsive species, what part does age play in the onset of cancer? It is usually said, and generally believed, that cancer is essentially a disease of old age, or of ageing tissues, but anyone who has had much to do with cancer in the human subject knows that it by no means infrequently occurs in quite young people. I therefore made two parallel series of experiments, using in one set adult mice and in the other mice all under six weeks old. Neither in yield of tumours nor in rate of tumour growth was there any appreciable difference between the two. This has been confirmed by subsequent experience so often that the fact is beyond doubt. The conclusion is that age by itself is not an important factor. It is merely a question of the length of time the causal agent has been in operation. We may argue that if we exposed a child of 10 and an adult of 40 to one and the same carcinogenic agent, and the latent period necessary was ten years, the cancer would declare itself when the former was 20 and the latter 50.

In view of the fact that countless and careful investigations of human growths have almost invariably failed to reveal the presence of any irritant, and knowing from previous experiments that tumours reaching the stage of malignancy continued to grow after tar applications had been stopped, it became of importance to determine whether the bias towards malignancy was given to the cells at a more remotely antecedent period. I therefore stopped the tar paintings as soon as minute warts made their appearance. Nevertheless, these small warts continued to grow and became epitheliomata just as speedily as if the irritant had been continued. Going still further back, I found that if I stopped the irritant before there was any sign whatever of neoplasia, in due course warts appeared and the phenomena of malignancy were unfolded just as before. Though, in mice, the usual course is first papilloma and then epithelioma, we have occasionally found that the epitheliomatous formation was not preceded by simple tumour. Bang has had similar results. We have grounds, therefore, for believing that in the case of human cancer, the antecedents of which are for the present hid from us, some irritant may have been in action and have disappeared, leaving no other evidence of its presence, long before the cancer declared itself.

My colleague, Dr. E. L. Kennaway, has been endeavouring to find the particular ingredient in tar which has this tumour-producing property. So far he has not isolated the substance, though it seems to be in greatest abundance in the higher boiling fractions. We know that pitch, for example, the solid part of tar left after the lower boiling fractions have been extracted, is associated with epitheliomatous ulceration in briquette makers, and he has been able to induce tumours in mice by using pitch dissolved in benzol or in lanoline. How does the pitch dust, a rather

*Immediately after this paper was read, Menetrier and Surmont reported a single success. Dr. J. A. Murray informs me that he has recently succeeded in two cases with an ether fraction of tar

insoluble substance, produce its harmful effects on the exposed skin? By dissolving pitch in human sebaceous fat I have produced malignant tumours in mice in less than three months. On the other hand, I have applied Scottish blast-furnace tar, which is produced at a comparatively low temperature, to mice for eight months without obtaining any sign of tumour formation. Tars are found to vary considerably. Thus we applied a direct ethereal extract of a tar to 500 mice, with the result that at the end of five weeks, so toxic was the extract, only 26 remained alive. As it was useless to continue we stopped the applications, but in one case a tumour appeared in the record time of thirty-seven days. It and several others which subsequently appeared became malignant. Using the same extract of another tar from the same gasworks we found no such toxic action, and the earliest tumour took nearly three months of repeated applications to declare itself. Kennaway's experiments are of practical importance because means may be found in the industries concerned to obviate the necessity of exposing men to dangerous distillation products of tar, and thus to prevent a certain number of cases of cancer.

Deelman of Amsterdam has discovered that if the tar applications are preceded four or five times by light scarification of the skin tumours result in the second month. Apart from this demonstration that the superficial layers of the epithelium act as fairly efficient barriers against the irritant, it seems to me that his experiments open up suggestive paths for the investigation of the relation between the processes of wound repair and malignant proliferation.

Murray has recently made a contribution which may have far-reaching results. He found that if he extirpated a tar epithelioma and then resumed the tar applications he could not induce any subsequent tumour formation in that animal. Further, if he removed a spontaneous tumour from a mouse and subjected that mouse afterwards to tar paintings it did not show any neoplastic response to the tar. In view of the fact that two different cancers are of very rare occurrence in the same individual, and, judging from statistics, much rarer than the laws of chance would indicate, he argues that the occurrence of one form of cancer in an individual protects the body in some way against the occurrence of another. The practical application of this must be obvious. There is, however, room for some difference of interpretation of the facts, and more extensive experiments may modify the conclusions that one is tempted to draw from these important observations.

I cannot here touch on numerous other observations by ourselves and other workers—the analyses of precancerous states, the reactions of defence, or the questions of immunity and susceptibility. Though of interest from the theoretical point of view, their practical bearing is not yet of general interest.

CHIMNEY-SWEEPS' CANCER.

It is now nearly 150 years since Percivall Pott called attention to the chimney-sweeps' cancer of the scrotum. Not only was this the first time that any tumour formation was attributed to a definitely ascertained irritant, but, still more important, it was the earliest recognition of the purely local origin of a cancer; as Pott said, it was not a "disease of the habit." Since his time numerous English authors have written on the disease without adding much to the classic description. Frequently they have remarked on the increasing rarity of this form of cancer, attributing the decrease to the wider recognition of the value of cleanliness amongst sweeps. In point of fact, it is probably as common to-day as it was then. The English mortality returns give a yearly average of five or six cases. There are two features about this cancer that merit attention: (1) its geographical distribution, and (2) its exclusive localization to the scrotum.

It is practically unknown on the Continent. By the courtesy of the Registrars-General of Ireland and of Scotland I gather that it is relatively common in the former country, and so rare in the latter that several years may elapse between cases. In their recent paper Southam and Wilson state that of 141 cases of cancer of the scrotum admitted to the Manchester Royal Infirmary during the last twenty years only one was a chimney-sweep. Thirty years ago Butlin dealt fairly exhaustively with the question why the disease was so common in England and so rare on the Continent, concluding that the greater protection in the matter of clothing in the case of the foreign sweeps and the different methods adopted abroad in the use of domestic coal accounted for the contrast. But no such explanation can account for the unequal distribution of the disease through the British Isles. It is well appreciated in industrial concerns that coals from different localities have their well marked characteristics; even in the same pit and the same seam coals of different composition exist. The tars obtained by the destructive distillation of different coals vary very much, and this holds good with regard to the pitches. Chimney-sweeps, whom I have questioned on the matter, claim to be able to identify the particular kind of soot which is most dangerous, though they do not agree in their description of its physical appearances. I suggest that the soot which contains the tumour-producing substances is derived from the more bituminous coals coming from the Midlands of England.

But even more mysterious is the fact that soot cancer in chimney-sweeps is confined to the scrotum. That one or two cases of epithelioma arising in other situations have been reported in workmen engaged in the handling of soot does not affect the general statement. Other parts of the body in sweeps are as much exposed as the scrotum, probably more exposed, to the action of the soot, and though occasionally soot warts may be found on the skin at other places, the scrotum is the seat of election of the epithelioma. The same thing holds to a lesser extent in the cases of pitch and paraffin cancer. Why should this be so? The laxity of the scrotal skin, enabling the soot to lodge in its folds, as suggested originally by Pott, seems to offer only a partial explanation. One peculiarity has hitherto escaped attention. The scrotum in the human subject contains unusually large sebaceous crypts, which are not infrequently rendered prominent by the retention of inspissated secretion. I imagine that the soot may lodge there, and that the carcinogenic principle it contains is abstracted and dissolved in the sebaceous fat.

For years experimenters have endeavoured to produce cancer in animals by means of soot, but without success. I have rubbed soot into the scrotum of rabbits (in which animals, be it noted, the scrotal skin is lax and rugose) thrice weekly for two years; I applied it to the scrotum of rats for a year; and I had batches of male mice living in boxes of soot for several months; but in no case did I succeed in producing any perceptible lesion of the epithelium. It may be that I was unfortunate in not having the right kind of soot, but I am more inclined to the belief that the natural solvent necessary is absent from the scrotum of these animals. Passey induced epithelioma in mice by painting on their backs an ethereal extract of soot. His experiments are valuable in demonstrating that soot does contain a tumour-producing fraction to which mice at least are susceptible, but it is obvious that in the animal body we have no such powerful solvent at work. To supply the natural solvent which I fancy is present in the human scrotum and absent or deficient in the scrotum of laboratory animals, I have had recourse to the sebaceous fat from ovarian dermoid cysts. I have to thank numerous gynaecologist friends for supplies of ovarian dermoids. Different samples of this fat vary a little, but they are all liquid at about body temperature, and they dissolve some fraction of soot, the melting point of the solution being lower than that of pure fat. The experiments with this solution have not proceeded far enough to forecast the result. I have already mentioned that with this sebaceous fat as a solvent for the active ingredients of pitch I have readily produced malignant tumours in mice.

PARAFFIN CANCER.

It has been known for fifty years that workmen exposed to the action of the crude products obtained by distillation of the oil-bearing shales of Scotland and of the brown coal (lignite) of Germany are prone to develop chronic skin affections, papillomata and epitheliomata, especially on the arms and not infrequently on the scrotum. The most

authoritative account of these occupational lesions, the result of several years of intimate observation, has recently been given by Dr. Alexander Scott of Broxburn, from whose pen we hope soon to see a more detailed study. My own experiments with paraffin-containing oils have not long been published and I need not recount them. It will suffice to recall the fact that the repeated application of these oils to mice brought about the formation of tumours. Simple papillomata, frequently multiple, resulted in many cases, commencing three months after the beginning of treatment. Some of the animals, however, even after nine months, showed no neoplastic reactions. Two cases developed carcinoma in seven and seven and a half months, and two developed sarcoma in six and ten months respectively. The sarcomata arose underneath simple papillomata, probably owing to the paraffin oils obtaining access to the underlying connective tissue through fissures in the warts. These sarcomata were slow to begin, but the subsequent growth was extremely rapid. Here is an instance of two very different kinds of malignant tumour being caused by the same agent. Rats and guinea-pigs did not tolerate well the applications of paraffin oils: the irritation of their skin was severe and few lived more than nine months. None of them showed tumour growth. The experiments with rabbits have gone on now for eleven months without yielding any sign of new formation. One of the oils used which induced epithelioma in the mice was an unfinished lubricating oil, the possible dangerous properties of which no one had previously suspected. We were surprised, therefore, to have our experiments confirmed quite independently by the clinical observations of Southam and Wilson. They called attention to the occurrence of cancer of the scrotum in mule spinners, attributing it to the action of lubricating oils. I have reason to believe that cancer of the scrotum amongst mule spinners is much commoner than even their paper suggests, and we shall await with interest the results of their promised experiments with the particular lubricating oils used in the mills of Lancashire. Most of the lubricating oils in commerce are obtained from crude petroleum, and though not more than three or four cases of petroleum cancer are recorded in literature, it is probable that unrefined petroleum is just as dangerous as shale oil. It may be that the results of our experiments with petroleums, which are in contemplation, may be useful in preventing the risks, at present unappreciated, to man. Since my paper was published I have frequently been asked if the habitual use of liquid paraffin as a laxative may not cause intestinal cancer. I do not know of any clinical observations pointing that way, and, until we obtain strong experimental evidence (which we have not yet elicited) to support it, it may be wiser to stifle any uneasy suspicion.

Arsenic Cancer.

Kennaway and I in a recent communication dealt with the late Sir Jonathan Hutchinson's theory that the prolonged use of arsenic medicinally may produce cutaneous epithelioma. Nearly all the reported cases were patients suffering from psoriasis, and though most dermatologists agree with Hutchinson, there are still some who dispute the relationship, believing that even in the absence of arsenic epithelioma may supervene on psoriasis. I have seen a workman in an arsenic factory who showed pigmentation, palmar keratoses, multiple papillomata, and multiple epitheliomata coexisting together, and I learned from him that several of his fellow workmen had suffered in the same way. Probably it is commoner than we had suspected. We reported that we had succeeded in producing a metastasizing epithelioma in a mouse by repeated applications of a weak solution of potassium arsenite. Feeding experiments on rats were negative. We have repeated the experiments on several series of mice, but have failed to produce another positive result. The difficulty, which is still unsurmounted, is to keep the animals alive for the necessary length of time while applying the arsenic solution in a concentration likely to be effective. Our single success, though a matter of good fortune, yielded us the necessary experimental proof of the carcinogenic power of arsenic.

X-ray Cancer and Radium Cancer.

The epithelioma to which, in the past, radiographers and others working with Roentgen rays have been so liable is probably the clearest example we have in man of an irritation cancer. Not much more than a quarter of a century has elapsed since *x* rays came into use, and, in the earlier days at any rate, a comparatively small number of men were subjected frequently to their action. Yet the number of cases of epithelioma of the hands of these workers has been inordinately high. Of seven radiologists of long experience with whom I have been acquainted, no fewer than four developed local cancer. Now that the dangers have been realized and adequate precautions adopted, its incidence is fast diminishing and we may never see it again. The lesions, expressing themselves as severe radiodermatitis followed by irregular hyperplasia of the skin, fissuring, simple ulcerations, and wart formations, intractable ulcers, and finally true epithelioma, often multiple, occurred on the back of the hands and fingers because these were the sites directly exposed to the rays when the operator was holding the fluorescent screen. So gradual was the progression from the slightest to the most serious manifestation that we could think of no moment when a new determining factor could intervene. Whether a single *x*-ray burn of sufficient magnitude is all that is necessary, or several burns, or numerous repeated exposures to lesser doses are essential has never been satisfactorily determined, but certainly the exposure lasted for several years in the cases with which I am familiar.

No one has yet succeeded in producing epithelioma in animals by the application of *x* rays. Marie, Clunet, and Raulot-Lapointe in 1911 reported that they had subjected a series of rats to frequent but very feeble irradiations without inducing any neoplastic lesion, but in another series where they used more destructive rays a sarcoma occurred on a site which had been treated nine times during five months, the tumour developing eleven months after the last séance. This observation excited slight interest at the time. It was dismissed by the critics as a chance occurrence, the spontaneous development of a tumour unconnected with the skin lesions induced by the *x* rays, a sarcoma to which rats are prone, and not the squamous-cell carcinoma such as is found in the human subject. Moreover, it did not arise for nearly a year after the exposures had been discontinued, and only one animal was affected. I have already stated that in spite of numerous experiments I have failed to produce epithelioma of the rat's skin by means of tar applications, whilst Russell has succeeded in producing sarcoma by the subcutaneous injections of tar, and in one of his rats the sarcoma started nearly a year after the injections were discontinued. It would seem as if the rat's connective tissue was much more responsive to the action of a carcinogenic substance than its skin. Though in the human subject the malignant tumour is almost always a frank epithelioma, yet I have examined a nodule removed from a radiologist, a supposed recurrence, which I would not hesitate to call a sarcoma, and in two of the cases reported by Porter sarcoma was a favoured diagnosis. Again the long delay after removal of the irritating agent fits in with my experiments, already quoted, on the delayed action of tar. If the experiments of Marie, Clunet, and Raulot-Lapointe could be repeated on a larger scale and gave the same result we should have to give the credit to these authors of being the first to produce cancer experimentally. Caulfeild and I failed to produce tumours by single exposures in the case of guinea-pigs, nor have we yet succeeded with thrice-weekly exposures over many months in the case of mice.

Probably the lessons that were learned of the harmful effects of unscreened Roentgen rays prevented similar accidents amongst those who have had to handle radium. At any rate, no such casualties have been reported. I have, however, seen two cases of radium warts on the forefinger and thumb, and I have heard of three cases of epithelioma in radium workers occurring on the Continent. Though I applied 6 mg. of unscreened radium bromide for ten minutes daily for several months to the backs of a batch of rats, I never succeeded in producing any perceptible skin lesion.

Tobacco Cancer.

That tobacco-smoking is one of the chief factors in setting up cancer of the oral cavity, and especially of the tongue, is an idea that has been widely held. Some have said that the lesions produced are due to the heat conveyed to the lips through the stem of the pipe or to the tongue by the smoke,

whilst others have maintained that they are due to the products of combustion of the tobacco. Still others have supposed that the noxious principles exist as such in the unsmoked tobacco and are not produced during combustion. In favour of this last idea are cited instances of malignant growths of the oral mucous membrane in tobacco-chewers, and much attention has been directed to the cancers of the cheek observed in natives of Southern India and the Philippines who chew "betel." Here, however, it must be noted that the betel preparation is a crude mixture of areca leaves, lime, and probably other substances as well as tobacco, and the effect of these accessories cannot be discounted. That betel-chewing is indulged in by millions—men, women, and children—and that the number of cases of cancer of the cheek actually observed by any one medical man seem to be surprisingly few, are points that should make us cautious in accepting this as an instance of cancer due to tobacco, or even as an example of an irritation cancer at all. Again, not a few surgeons of great experience in lingual cancer have stated that tobacco-smoking is of quite subsidiary importance in producing the lesions which, in their opinion, are the sequelae if not the result of local tertiary syphilitic infections.

I need not discuss the arguments at length, for the discussion would be as fruitless as the arguments are interminable. Can experiment help us to settle the question? I must leave aside, as too difficult of approach at present, the test of heat, syphilitic infection, and other general irritations, merely remarking that Fibiger succeeded in producing leucoplakia and epithelioma in the tongue of the rat by an animal parasite (*S. neoplastica*), and record the results with tobacco. We set up an artificial pipe where the tobacco was smoked by suction from a water pump and collected the fluid products of combustion, such as are found in the stem of an ordinary pipe. These products consisted of a brown tarry material easily soluble in chloroform or ether, and a light-coloured watery fluid which darkened through time or by oxidation. The latter fraction, tested on mice for over a year, was without toxic properties and produced no pathological effects whatever. The chloroform-soluble fraction, with the solvent driven off, had, on the other hand, both toxic and pathogenic properties. A minute trace of it applied to the mucous membrane of the tongue or of the vagina, or even to the skin, of rats and mice brought about death by clonic convulsions, usually within a minute. This poisonous effect is probably due to nicotine. By diluting the tarry fraction with acetone to 5 per cent. and afterwards gradually increasing the concentration we found that we could accustom the mice finally to the undiluted stuff. Again, we boiled the tobacco in water first of all in order to deprive it of nicotine and obtained a non-toxic product by smoking. We applied these fractions to two series of mice for many months. They produced epilation of the areas to which they were applied, and they induced chronic ulcerations, but in no single case did any neoplastic reaction result. We have thus no evidence in support of the contention that tobacco smoke contains a cancer-producing property, though we may not therefore conclusively reject the idea that there is something connected with tobacco-smoking which may be operative on the oral mucous membrane of human beings. But what is of more theoretical and practical interest is the fact that here we had a substance with a very marked irritative effect on the skin in that it produced chronic lesions and yet no tumour formation supervened. We might say that it is not a specific irritant of the tumour-producing class.

ANILINE CANCER.

In the German literature much has been made of the occurrence of tumours of the urinary bladder in workmen engaged in the manufacture of aniline dyes. Though we have insufficient data to allow us to say that the incidence of bladder cancer amongst them is much greater than in the general population, the reports of its absolute frequency lead us to regard it as a particular form of cancer to which dye workers are liable—an irritation cancer of a different kind from what we have been considering. No cases have been known to occur in English dyeworks. There is no general agreement amongst the authors as to the particular chemical substance responsible for the condition, and an analysis of the reported cases with reference to the process in which the men were employed fails to reveal any definite clue. In one factory the greater number of cases may occur in the aniline department, in another the fuchsin workers would seem to suffer most, and so on. To complicate matters still further, cases have been noted in clerks and others who do not come directly into contact with any of the processes. This has led to the belief that it is something in the atmosphere. Miss Alice Hamilton, the American authority on industrial diseases, has suggested that the particular noxious substance is hydrogen arsenide, but the German experts strenuously deny that this is present in their workshops, and, as far as I know, no case of so-called aniline bladder cancer has exhibited the usual skin changes that are found in arsenic workers. Aniline, benzidine, and fuchsin are the main products that have come under suspicion. Inhaled, or absorbed through the skin, they undergo probably very complex changes in the economy, and are excreted in different combinations in the urine. It is imagined that the long-continued action of low concentrations of these end-products, whatever they may be, on the epithelium of the bladder induces villous papilloma and finally epithelioma. No other tissue of the body responds in this way to the aniline derivative: it is definitely selective in its action; indeed, the kidneys and ureters, equally exposed to it, do not show tumour formations.

If we could produce cancer of the urinary bladder in animals by applying some aniline product to the skin we would succeed in carrying our experimental inquiry to a more important stage than it has yet reached; it would enable us to demonstrate clearly the selectivity of a carcinogenic agent. So far we have given a prolonged trial to aniline, benzidine, and fuchsin, applied to the skin of mice, but in no case have we produced any neoplastic response either in the bladder or elsewhere. We have also kept series of mice for a long time on xylene and benzene, the precursors of most of the aniline substances, but here also we have failed to induce tumours. Everybody knows the irritating effect of xylol on the skin. In the case of mice its long-continued application produces epilation and that chronic scurfy dermatitis which we generally find with all the tumour-producing agents we have hitherto employed. In several cases, after the lapse of several months, we obtained what we thought were flat warts of a non-progressive character. The histological examination of these, however, showed us that there was no epithelial proliferation but merely a peculiar vitreous degeneration of the tissues of the dermis. Though the experiments, therefore, are negative as far as tumour production is concerned, and leave the question of aniline cancer as undecided as before, those with xylol especially are of value in indicating once more that all tissue irritants have not the property of setting up, or paving the way to, cancer.

OTHER SUBSTANCES.

In addition to those I have mentioned we have tried a large number of substances which might be supposed to have an irritant action on the tissues, but they have proved altogether incapable of producing tumour formation. Thus we may tentatively claim that there are only certain specific agents which have the property of eliciting neoplastic reactions. We hope in the course of time to discover more. It will not escape notice that in all the cases in which we have succeeded in producing tumours experimentally, these tumours, epithelioma or sarcoma, are of the same structure whatever substance we employed to produce them. No one examining the final lesion could say what particular agent we used. And it might be maintained as strongly as before that some single common cause must be postulated. It does not follow. Similar acute or chronic inflammations may be caused by very different bacteria.

I must leave to some future occasion the argumentation regarding these disputed points, but even supposing our contentions that some of the substances above mentioned are direct causes of cancer be admitted, it might yet rightly be urged that they are all external irritants, that they are responsible only for a very small number of cases of cancer in the human subject, and that we have thrown no light whatever on the processes that occur within the cells to pervert them to the anarchic and progressive proliferation that we call cancer. We may reply that the demonstration that

has already been given tempts us to hope that some day we shall be able to isolate endogenous carcinogenic substances, local malproducts of metabolism it may be, which have similar effects on tissues long subjected to their action. It is true that we know nothing regarding the intimate cell processes that are set up by the irritants, but the investigation is not beyond practical methods of inquiry.

May I recall some old experiments that I did several years ago? I had a transplantable mouse carcinoma which had passed into a depressed phase: the percentage of successful inoculations was very low; when tumours did result they were very slow in their growth. I ground up some of the tumour material in fine sand in a mortar and shook this up with saline solution. A batch of mice were injected with this extract and subsequently they were inoculated subcutaneously with living tumour tissue at the same time as another untreated series of mice. The contrast between the two sets was striking: in the untreated series the proportion of successful inoculations was small and the tumours were slow in developing; in those previously treated with the extract the percentage of successful inoculations rose from 30 to 80 and the rate of growth was rapid. We had supplied something—a "growth aggressin"—which was not supplied to the controls, and we had obtained it from the same tumour tissue. Such a substance, whatever its nature may prove to be, may be produced in small amounts in ordinary wound repair: it may be produced in excessive amounts in the neoplastic reaction.*

Looking back on the great discoveries of the past, we may wonder why they were so long delayed. The essential data for a conclusion, the materials with which to build, the terrain for the advance, all were already prepared, available for everybody, and sufficiently obvious, we should imagine, to the ordinary mind. It is all so simple to us now, for we fail to appreciate the difficulties of the pioneer. A future generation, knowing surely the causes of cancer, will have no patience with our flounderings, our guesses, and our contending arguments. Had we not all the facts before us, they will say, staring us in the face, clamouring for recognition? Probably we have, but we are like children gazing at a starry sky—the stars that are so bright to us may be very small worlds and those that we barely see may be infinitely great. When we can place our facts in their order of importance, and make order out of seeming disorder, the answer will be easy. At present do we stand in respect of our subject as our predecessors stood fifty years ago at the dawn of bacteriology, and will our discoveries be as great, as rapid, and as epoch-making as theirs? I wonder.

SURGERY OF THE HEPATIC AND COMMON BILE DUCTS.†

BY

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THE great bile duct as a whole, from the point where the hepatic duct emerges from the liver to the duodenal papilla, is discussed because the pathologic processes with which the surgeon is concerned in this special field must be treated as a whole.

In the period from December 31st, 1890, to December 31st, 1922, there were 16,980 operations performed on the biliary tract for all conditions — acute, chronic, and malignant—by the eleven surgeons on the general staff of the Mayo Clinic, with an average mortality of 2.6 per cent. Of these operations 1,920 were on the hepatic and common ducts, with an average mortality of 7.8 per cent. In the ten years from 1910 to 1920 the average mortality for operations on the great bile duct was 6.8 per cent. In 1921 the mortality for operations on the common and hepatic ducts was 5.6 per cent., in 1922 it had dropped to 3.8 per cent., while in 1922, for 942 cholecystectomies, it was 1.6 per cent.

All patients dying in the hospital following operation, without regard to the length of time thereafter or the immediate cause of death, were classified as having died from the operation. It may seem somewhat severe to classify patients as having died from operation who, when operated on, had chronic nephritis, hepatic insufficiency from biliary cirrhosis, and secondary cardio-renal disturbance, the result of months of cholaemia and duct infection, and patients who died in the hospital some weeks after operation from causes not connected with the operation. However, without an arbitrary standard of classification it is difficult to secure comparable statistics from different hospitals. Perhaps, too, there is a certain stimulation in holding to a high standard of responsibility.

A satisfactory improvement, so far as mortality is concerned, is manifest by these data. Improvement has been greater than would be apparent from a study of mortality alone, because of constantly increasing knowledge and improvement in technique. Because of a better understanding of the conditions more and more severe cases have been undertaken, and operations carried out successfully which, in earlier days, were not attempted.

Certain fundamental principles which greatly affect the welfare of surgical patients must be evaluated. They concern (1) mortality from the operation, (2) benefit from the operation, and (3) disability following the operation.

The pride of the operator and his statistical skill in honestly juggling percentages make most astonishing apparent differences in statistics which are nearly identical. For instance, the early transference of the dangerously ill patient to the medical side of the hospital because of a medical complication, from the standpoint of surgical statistics, is helpful. If operations rather than cases are counted, and a number of operations are performed on the same patient, a small series of cases may make a large series of operations. Mortality estimated by cases is high; estimated by the number of operations it is low, although the number of deaths would be the same. Again, a slight operation which does not cure will be the test in a bad case. If the patient does not react well, the curative procedure with the major operative risk, for many reasons, may not be undertaken; consequently the patient is not given the chance for cure which a primary radical operation would have given.

We study surgical tragedies and endeavour in every way to hold operative mortality at the lowest point, but the mere fact that a patient recovers from an operation is not in itself sufficient. If he does not receive sufficient benefit to warrant the risk of life, the pain and suffering from the operation itself, the expense, and the loss of time, he has just cause for dissatisfaction. On the other hand, if a more radical operation would have resulted in correspondingly greater benefit, an increase of primary risk might be justified.

The question of post-operative disability is important. A surgical procedure should be planned so that the patient, with the least possible risk and loss of time, will receive the greatest possible benefit. To-day industry is on a full-time basis, and every unnecessary day that the patient is disabled is an economic loss. To perform several operations when one would suffice, and thus deduce an apparent but not a true reduction in mortality, to use a type of incision not strictly indicated for the work at hand, or to use unnecessary drainage which will confine the patient to bed longer, or leave him with a greater hernia liability, is unjust. This economic loss is illustrated by a comparison, at ten-year intervals, of the hospital morbidity following operations on the biliary tract. The methods in use to-day, as compared with methods used ten years ago, save for each patient operated on in the clinic ten days of hospital time, or thirty-six years of the lifetime of one person each year.

The incision used in the majority of operations on the biliary passages has been the incision introduced by Bevan in 1898, slightly modified. The method of McArthur, in leaving undivided the posterior aponeurosis, the peritoneum, and the nerves in the lower third of the incision, is followed because the posterior aponeurosis, peritoneum, and nerves are sufficiently mobile to be drawn down readily by a retractor.

Secondary operations on the common duct for the removal

*Important experiments in tissue culture which are being carried out by A. H. Drew of the Imperial Cancer Research Fund may have an important bearing on these points.

†Abstract of paper read before the Surgical Section of the Royal Society of Medicine, London, June 27th, 1923.

of stones, especially if the gall bladder has been removed at the first operation, may be most difficult, particularly if dense adhesions bind the area in a confused mat, and a state of hepatitis, or biliary cirrhosis, makes the liver bleed at a touch.

The importance of removing all stones from the common duct cannot be overestimated. In nearly one-third of the deaths following operation on the common duct for stone in our series, *post-mortem* examination revealed that all stones had not been removed. Since *post-mortem* examinations are made on more than 90 per cent. of patients who die in the hospital, this checking up has been of very great importance in adding to knowledge, although often most humiliating to the surgeon. Perhaps some of the stones which are supposed to have re-formed in the common duct are left-overs.

Next to gall stones in the hepatic and common ducts, operative injuries during cholecystectomy are the most common cause for operations on the common duct. The most serious and difficult operations are those which have for their purpose restoration of totally interrupted biliary connexion between the liver and the intestinal tract. When the common or hepatic duct has been injured, and the fact has been recognized at the time, failure successfully to repair the injured duct has not occurred in a single instance. A study of the operative methods employed in these cases, from the standpoint of ultimate results, indicates that in any case in which a piece of the duct has been accidentally removed, and the injury not discovered and repaired at the time, thus necessitating secondary reconstruction, direct union between the stump of the hepatic duct and the duodenum is the best operation.

Of the causes of death after operation, haemorrhage, hepatic and renal insufficiency, and infections of the bile ducts are the most common. These conditions are directly related to the existing chronic obstructive jaundice, hepatitis, biliary cirrhosis, dehydration, and chronic undernourishment. Walters reviewed the *post-mortem* records, for a five-year period, of patients who died following operation on the biliary tract, and demonstrated that in 58 per cent. of the patients with jaundice who died within the first week after operation, there was more or less blood in the abdominal cavity, usually the result of oozing from slight injuries to the liver. Of itself the haemorrhage was not always sufficient to cause death, but it was a contributing factor. In jaundiced patients in poor condition, unless there is a definite indication, cholecystectomy is not added to the risk of operation on the common bile duct because of the danger of injury to the liver, which adds to the possibility of slow post-operative oozing.

As these patients are dehydrated and usually unable to take much nourishment, an attempt is made before operation to introduce a quantity of water into the system to aid renal elimination. As a rule it is difficult to accomplish this by mouth; it is best accomplished by proctoclysis, or subcutaneously.

A third factor of importance in these cases is hepatic insufficiency, which runs parallel with renal insufficiency. In the presence of hepatic insufficiency the blood sugar may appear to be at the normal level when it is not truly so, because of the concentrated state of the blood from dehydration. Therefore, in the presence of hepatic insufficiency, 5 per cent. glucose, in plain water by rectum, or 3 per cent. in sodium chloride solution subcutaneously, is given.

In order to check the haemorrhage calcium chloride intravenously has proved effective, and in certain cases blood transfusion is a remedy of remarkable efficiency. Failure of normal blood-clotting in the jaundiced patient is a specific indication of deprivation of blood calcium. It remained for Lee and Vincent to give calcium in a 10 per cent. aqueous solution intravenously, with striking results. When the administration of calcium fails to reduce the clotting time to normal, blood transfusion will usually cause a temporary reduction in the clotting time sufficient for an operation to be performed.

The careful pre-operative management of jaundiced patients has greatly reduced the mortality of operations. In two years in not a single instance in the clinic has a patient so prepared died from haemorrhage following the operation.

CASES ILLUSTRATING METHODS OF DIAGNOSIS IN RENAL SURGERY.*

(With Special Plate.)

BY

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IN spite of its already voluminous literature, the subject of cystoscopy, pyelography, and ureterography is so important that no apology is needed for bringing forward some interesting points in the application of these methods of diagnosis.

Kidney or ureter cases usually present themselves for investigation because of one or other of the symptoms—pain, haematuria, dysuria, or pyuria which does not yield to potassium citrate or the usual urinary antiseptics. On the other hand, some cases which eventually prove to be of urinary origin come under observation because of symptoms not necessarily suggesting the upper urinary tract as the seat of trouble; for example, in one case which I shall quote, asthma was the only symptom of ill health in the first instance.

Assuming that one of the typical urinary symptoms is present, that a pathological and bacteriological examination of the urine, and a clinical and *x*-ray examination of the renal, ureteric, and bladder regions have been made, an approximate diagnosis will probably have been reached, but many points will still remain to be investigated. Thus, if pyuria is present, the question whether it is of badder or renal origin remains. The general recognition of the fact that most cases of persistent pyuria are of renal origin must be credited to the wide adoption of cystoscopy. Simple observation of the ureteric orifices or ureteral catheterization will localize infection or haemorrhage to one or other kidney. The ureteric catheter will provide material for estimating the efficiency of each kidney. Catheterization and aspiration may determine the existence of a hydronephrosis.

In almost every case pyelography will contribute some fresh details in the investigation. In renal calculus one will learn whether the stone is in the renal pelvis or in a calyx—an important point in planning operation. The shadow of a ureteral stone can be differentiated from other shadows like it by a pyelogram, but sometimes an *x*-ray photograph of the opaque ureteral bougie *in situ* will suffice. The cases mentioned below will illustrate these among other points.

The method of performing cystoscopy and of obtaining a pyelogram are now standardized. In injecting the ureter one depends on the patient's sensation of fullness or pain to indicate when enough of the opaque solution has been injected. For ordinary cases no special apparatus is necessary, save the cystoscope, ureteral catheters, and access to a radiologist. Dr. Oram has taken all the photographs in the cases mentioned in this paper. In most cases the ordinary *x*-ray couch serves for the various cystoscopic procedures, and conversely the *x*-ray tube can be used with the patient resting on the cystoscopy table. The latter arrangement will suit best when a photograph in semi-upright position is desired.

The first case I shall mention is one illustrating how, in certain cases of chronic pyuria, cystoscopy by itself excludes the bladder, and localizes the active septic focus to the kidney.

CASE I.

Some six months before I saw him, the patient, a man of 5[illegible], had an acute attack of cystitis with frequent micturition, suprapubic pain, and abundant pus in the urine. The attack came on after six hours' exposure to tropical rain. He was very ill and was admitted to a foreign hospital, where his bladder was washed out several times a day and urinary antiseptics administered. Under treatment his symptoms improved, but albumin and pus, as well as staphylococci and a coliform bacillus, remained constantly in the urine. On examination one saw that the mucous membrane was healthy everywhere save at the orifice of the right ureter

*A paper read at a clinical meeting of the Lancashire and Cheshire Branch of the British Medical Association.

where the lips of the opening were engorged, and below that orifice there was a fan-shaped inflamed area, marking the track of the shoot of urine from the orifice. The jet of urine from the right orifice was turbid, while that from the left was clear. The condition was either simple or calculous pyelitis. Radiographically a large stone was to be seen in each kidney (Fig. 1). Subsequent catheterization of the ureters after a meal of 15 grams of urea confirmed the infectivity of the right and the non-infectivity of the left kidney, and the differentiated urines showed: on the right side 1.2 per cent. of urea; on the left 1.5 per cent. The stone was removed from the right kidney by pyelotomy, and after six months' treatment with urinary antiseptics and vaccines, and when the pus had disappeared from the urine, the left kidney was similarly treated. When last seen before going abroad, albumin had quite disappeared.

The next two cases I shall mention are cases in which cystoscopic examination, taken in conjunction with clinical signs, facilitated definite diagnosis of tuberculous kidney in spite of the fact that tubercle bacilli could not be found in the urine.

CASE II.

The first case was a woman of 42, who gave a history of having had an abscess in the left loin, which was opened about three years ago. The abscess discharged for some months and then healed, only to break down again after another few months.

The urine was normal and the patient denied that there had ever been any urinary abnormality. The doctor who was last in attendance, however, suspected kidney trouble and sent her for further examination. At this time there was a sinus in the left loin discharging pus containing staphylococci. In the circumstances, and in the presence of normal urine, the suppurating focus might have lain in any of the neighbouring structures, but cystoscopic examination showed that there was only one functioning ureter—the right. There was no trace of the left ureteric orifice even after an intramuscular injection of indigo carmine. In the region where the left ureteric orifice should have lain, however, there were three or four cicatrices of healed ulcers. It was only at this stage that the patient could be induced to remember that

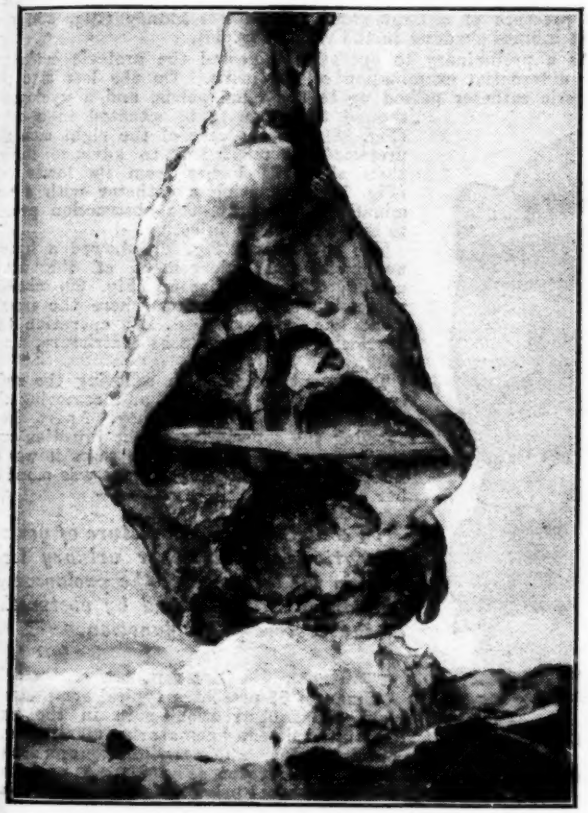

FIG. A.—Case II. Remains of old tuberculous kidney, showing fibro-fatty capsule with trabeculae and caseous débris below.

twenty-five years previously she had had haematuria, and increased frequency of micturition, lasting over a period of six months. With this confirmatory fact it was possible to realize what had occurred—that at the age of 16 to 17 she had suffered from an actively tuberculous kidney. The caseous débris had, later, blocked the left ureter and allowed the secondary ulceration of the bladder to heal.

In this case I removed the kidney, or rather its representative—a large sac of caseous matter contained in the fatty capsule, subdivided by fibrous strands, but containing no trace of kidney tissue (Fig. A). Probably there had been no trace of secreting tissue for over twenty years.

CASE III.

The second case of tuberculous kidney I shall mention was in a girl of 19, who had been wardmaid in a sanatorium for tuberculosis. She suffered from hectic fever, night-sweats, intermittent haematuria, colic on the right side, and a considerable amount of pus in the urine. Tubercle bacilli were not found. She had very frequent micturition, and her bladder could not be induced to tolerate more than 2 ounces of fluid. It was necessary to give her an anaesthetic for cystoscopy, and then one had an opportunity for a moment of seeing and catheterizing the left ureter and of ascertaining that the right ureteric orifice was situated in the centre of an ulcer in the posterior wall of the bladder. The cystoscope was removed, the catheter being left in position, and the patient allowed to come round from her anaesthetic. She was given 15 grams of urea, and in an hour and a half she was found to have a concentration of 2 per cent. urea in the urine from the left kidney. There were some blood and pus cells in the urine from the left kidney, but in view of its power of concentrating urea, and as the symptoms of colic, haematuria, hectic fever, and night-sweats were pressing, the right kidney was removed. It was found to be tuberculous and secondarily infected (Fig. 3).

FIG. B.—Case III. Tuberculous kidney with mixed infection.

She was excreting 45 ounces of urine when she left hospital, but there was still some pyuria.

The differentiation of the x-ray shadow of a phlebolith or of a mesenteric gland from that of ureteral stone is frequently necessary. I will first show the appearance of a genuine ureteral calculus in relation to the opaque bougie and the opaque injection, and then show cases where the pyelogram or ureterogram excludes the possibility of urinary calculus in favour of phlebolith or calcareous gland.

CASE IV.

A young man of 23 had suffered from one attack of haematuria and from intermittent pain in the right iliac fossa and right inguinal region. The *x* rays showed a shadow which was probably a stone in his right ureter (Fig. 2). Cystoscopically the bladder and the ureteric orifices were normal. Examination of the urine showed nothing definite once the slight haematuria had passed off. On passing the ureteric catheter, it was stopped at a point short of the renal pelvis. Fig. 3 shows the catheter held up. Fig. 4 shows the sodium bromide injection passing round the stone and partly dilating the renal pelvis. The stone, obviously ureteric, was removed extraperitoneally.

CASE V.

In contrast with the case just mentioned is that of a medical student, aged 20, who had suffered from pains in the right iliac fossa and inguinal region for some months. The pains had recently disappeared, but while they were present they had occasionally been accompanied by haematuria. Later on he passed per urethram a small calculus, which Dr. Duffield analysed and reported as consisting of phosphates. The urine was normal. A radiogram showed a shadow at the brim of the pelvis over the course of the ureter, and the question arose as to whether this shadow was a ureteral calculus or a calcareous gland. Catheterization of the ureter could only be effected to the extent of a couple of inches (Fig. 5), but on injecting the ureter with sodium bromide the shadow, though in contact with that of the ureter, was seen to be independent of the latter (Fig. 6). The ureter is seen to pass the region of the doubtful shadow without dilatation or distortion—this in contrast to the photographs in the previous case, where the injecting solution is seen to surround the stone. The shadow in the present case is evidently that of a mesenteric gland.

CASE VI.

In contrast with Case IV, too, is Case VI, that of an old lady suffering from intermittent haematuria accompanied by colicky pains in the right loin. The *x*-ray appearances of the renal region were negative. In the ureteral region they showed two circular shadows low in the pelvis, and in the course of the right and left ureters respectively (Fig. 7). An *x*-ray examination made with the ureteric bougies in position showed that the shadows did not in fact lie in the course of the ureters (Fig. 8). At a later examination when the haemorrhage was actually in progress the blood was seen to be coming from the

left ureter. In the absence of pus or *x*-ray evidence of stone, the presumption was in favour of a growth of the left kidney. No operation was performed owing to the feeble condition of the patient, but the rapid increase in size of a gland above the left clavicle confirmed the existence of malignant disease in the drainage area of the thoracic duct. The shadows in the pelvis were phleboliths.

CASE VII.

This patient was a seaman aged 36. When homeward bound from Australia he was seized with severe pain in the right iliac fossa and right testicle. He was obliged to lie up for three or four days. He was then transferred to hospital ashore at a Mediterranean port. There he was *x*-rayed and a diagnosis of calculi in the pelvic ureter on the right side was made. Being anxious to get home he declined treatment and continued his voyage. The severe pain had passed off in two days from its onset, but he suffered from slight abdominal aching for upwards of a fortnight. On reaching Liverpool, two months later, he was referred to me for further investigation and treatment. The urine was normal. Palpation revealed slight tenderness in the right iliac fossa. Radiographically a number of circular shadows were visible in the right lower pelvis (Fig. 9), but a photograph with the opaque bougie in position showed that the shadows lay clear of the ureter (Fig. 10). The renal pelvis was normal.

The original illness was evidently due to appendicitis, of which testicular pain is an occasional symptom. This diagnosis I verified by operation, finding a retrocaecal appendix lying over the course of the ureter, buried in adhesions and acutely kinked.

A ureteral calculus may exist side by side with a phlebolith, and the latter with its associated fibrosis may prevent the passage downward of the former.

CASE VIII.

The patient, a man of 37, suffered from repeated attacks of right loin pain radiating downward to the testicle. A radiogram showed two shadows in the region of the lower right ureter (Fig. 11). The ureteric bougie passed the lower shadow and thrust the upper shadow upwards for a couple of inches before being stopped (Fig. 12). The ureterogram (Fig. 13) showed that the lower shadow lay outside the ureter, and that the injection could not pass backward below the point of the ureter in contact with the phlebolith. The ureteric catheter occupied the entire lumen of the ureter at this point. At operation I found the ureteral calculus lying beside the phlebolith, separated only by the ureteral wall. The phlebolith was surrounded by a mass of fibrous tissue which involved the ureter, and determined the obstruction. The calculus was removed and the obstruction dilated.

The fact that a pyelogram is normal helps one to exclude the possibility of a surgical condition of the kidney in a doubtful case of loin or abdominal pain.

CASE IX.

A woman of 54 complained of a constant aching in the right iliac region. The routine *x*-ray examination of the urinary tract showed no abnormality. The urine was normal. A pyelogram in the semi-upright position showed a normal renal pelvis (Fig. 14).

The patient is now wearing a visceroptosis belt and has obtained relief.

CASE X.

A young woman complained of severe pain in the left iliac fossa and on the front of the left thigh. An *x*-ray examination of the urinary tract was negative. The urine was normal. A pyelogram taken as in the last case was normal. The pain was so severe that I explored the abdomen, and found high up at the root of the mesentery a large tuberculous gland. Its removal relieved the symptoms. The pyelogram helped to exclude a renal condition, and limited the exploratory operation to the abdominal cavity.

When an intramural ureteric stone remains in situ *for some time the ureteric muscle tires in its efforts to expel it. It is of interest to observe the later changes in the appearances presented at the ureteric orifice.*

CASE XI.

Shortly after her confinement, a woman came complaining of severe pain in the right inguinal region, coming on at short intervals. There was pyuria and slight haematuria. *X* rays showed a stone in the lower part of the right ureter (Fig. 15).

Cystoscopically the left ureteric orifice was of the normal slit-like type; the right was a circular dark hole, and any attempt to pass the urethral bougie brought one up against the stone. When the orifice was kept in view for a short time, one could see the lower pole of the stone rhythmically presenting at the orifice as the ureteric muscle endeavoured to thrust it through. With each contraction one could see round the presenting stone a circle of jets as the urine was forced out. The presentation of the stone in the orifice was sometimes accompanied by distinct pain, and the whole phenomenon was, in miniature, what is seen during a labour pain when the foetal head is presenting and receding. When I first saw her a few months ago she had just been confined and was nursing her baby. As the pain was not severe, and the stone likely to pass spontaneously, I thought it desirable to postpone operation. In the course of five months the stone failed to pass into the bladder, and I have since removed it through the bladder. In the meantime the cystoscopic appearances had altered completely. The stone no longer presented intermittently at the ureteric orifice, and though the kidney still functioned, the efflux trickled away constantly, and not with a periodic jet. The ureter had evidently become dilated and lost its power of rhythmic ejaculation.

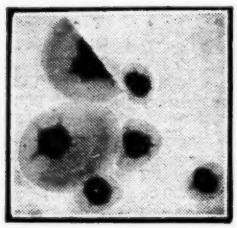

FIG. C.—Case XIII. Stones *x* rayed after removal, showing oxalate core and uric acid and magnesium salts in periphery.

In hydronephrosis it is not always possible to demonstrate the condition by aspiration. The aspirating catheter may not pass the obstruction, and when the syringe is applied nothing may be drawn off. In such a case an opaque injection may be made to pass the obstructing stricture or kink, and the ureterogram or pyelogram to demonstrate the obstruction.

CASE XII.

Mrs. D., aged 54, had for six years been suffering from severe spasmodic asthma. She had had various forms of treatment, including Tucker's asthma cure, morphine injections, and adrenaline injections. The adrenaline had the power of cutting short an attack, but there was no means of preventing it. Her doctor found pus in the urine, and with the aid of *x* rays demonstrated the presence of a large stone in the left kidney (Fig. 16), and some minute shadows in the right (Fig. 17).

As a preliminary to operation I passed the ureteric catheters for differential examination of the urine. On the left side the ureteric catheter passed up to the renal pelvis, and a pyelogram showed the stone to be situated in a calyx (Fig. 18). In the case of the right side the ureteric catheter failed to advance higher than about 2½ inches from its lower end (Fig. 17), but using a catheter with a terminal opening only, the obstruction proved to be permeable to injection.

The pyelogram (Fig. 19) showed a hydronephrosis and enlargement of the upper ureter; the ureterogram (Fig. 20) showed narrowing of the shadow where the instrument had been stopped. At operation this narrowing was found to be a stricture, not a kink.

Treatment consisted in relieving the stricture in the right ureter and removing the stone from the left kidney. Apart from showing the superiority of the injection over the opaque bougie in certain cases it was of interest to find that the patient was cured of her asthma.

FIG. D.—Case XIV. Pyonephrotic kidney after removal. (Compare Figs. 23 and 24.)

In contrast with the picture of general dilatation of the upper urinary tract seen in the last case, is the pyelogram of a hydronephrosis caused by obstruction at the uretero-pelvic junction.

CASE XIII.

A man of 58 presented typical symptoms of right renal obstruction—pain in the right loin, intermittent haematuria, alkaline urine containing pus. The *x*-ray photograph showed faint shadows in the right renal region (Fig. 21). A pyelogram showed dilatation confined to the renal pelvis (Fig. 22), and localized the shadows in the dilated pelvis. At operation an artery was found passing from the aorta to the inner aspect of the kidney, half an inch below the renal sinus. With the kidney *in situ*, the ureter lay in front, and the dilated pelvis behind the vessel. The vessel was removed, also half a dozen stones from the renal pelvis by pyelotomy. The stones were probably secondary to the stasis caused by the abnormal vessel. The shadows seen in Fig. 21 were smaller than the stones themselves. This is explained by the radiogram of the calculi taken after removal (Fig. C). Each stone shows a dense core, and less dense periphery. The core consisted of calcium oxalate, magnesium salts, and albuminous material; the periphery of uric acid and magnesium salts.

Under magnification the original of Fig. C showed the lamination of the periphery of the shadows. In such a case a pyelogram is necessary as a means of fixing the level of the obstruction, and of locating the calculi in the pelvis.

FIG. 1.—Case I. Stone in right renal pelvis. Radiogram taken after finding pus coming from right ureter.

FIG. 2.—Case IV. Shadow in course of right ureter.

FIG. 3.—Case IV. Ureteric bougie stopped by ureteric calculus.

FIG. 4.—Case IV. Opaque injection surrounding ureteric calculus and partially filling upper ureter and renal pelvis.

FIG. 5.—Case V. Doubtful shadow in ureteric region.

FIG. 6.—Case V. Injected ureter, showing that the doubtful shadow is independent of the ureter.

FIG. 7.—Case VI. Shadows in the course of right and left ureters respectively.

FIG. 8.—Case VI. Opaque ureteric bougie *x* rayed *in situ*, showing that the shadows in this case lie free of the ureters.

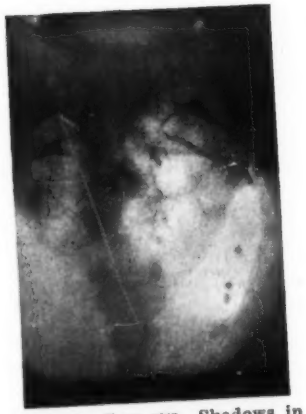

FIG. 9.—Case VII. Shadows in course of right ureter.

FIG. 10.—Case VII. Opaque catheter *in situ*, showing that the stones are extraurethral.

FIG. 11.—Case VIII. Showing two shadows in the region of the right ureter.

FIG. 12.—Case VIII. Shows the ureteral bougie passing one of the shadows and thrusting the other upwards.

FIG. 13.—Case VIII. Opaque injection surrounding upper shadow (ureteral calculus). The reproduction is not deep enough to show the stricture of ureter at level of phlebolith.

FIG. 14.—Normal renal pelvis as seen in Cases VII, IX, and X.

FIG. 15.—Case XI. Stone in the intramural portion of the right ureter.

FIG. 16.—Case XII. Showing stone in left renal region.

FIG. 17.—Case XII. Showing limit to which ureteral bougie could be passed.

FIG. 18.—Case XII. Left pyelogram, showing that the stone is in a calyx. (Compare Fig. 16.)

FIG. 19.—Case XII. Right pyelogram, showing hydronephrosis and dilatation of upper right ureter. (Compare Fig. 17.)

FIG. 20.—Case XII. Showing lower right ureter with obstruction where the bougie had been held up. (Compare Fig. 17.) The bladder is filled with 25 per cent. sodium bromide.

FIG. 21.—Case XIII. Right renal region, showing various small shadows.

FIG. 22.—Case XIII. Pyelogram showing right hydronephrosis. The ureter is not dilated, the obstruction lying at the ureteropelvic junction.

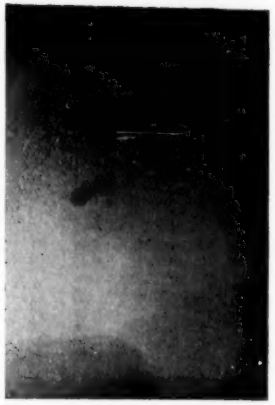

FIG. 23.—Case XIV. Left renal region, showing small calculus.

FIG. 24.—Case XIV. Left pyonephrotic kidney injected. (Compare Figs. D and 23.)

In pyonephrosis a pyelogram materially assists in prognosis.

CASE XIV.

A woman of 36 suffered pain in the left loin, pyuria, and irregular fever for six months. There was definite enlargement of the left kidney. *X* rays showed a small calculus (Fig. 23). No urine could be obtained by catheterization of the left kidney. Catheterization of the right kidney after 15 grams of urea gave a urea concentration of 1.8 per cent. A pyelogram showed cavities occupying the greater part of the renal region (Fig. 24). At operation these cavities were found filled with pus, and the kidney shown in Fig. D was removed. It consisted merely of fibrous loculi and contained a small stone.

It was possible to say prior to operation that nothing short of nephrectomy would relieve such extensive suppuration and disorganization.

NOTE ON "DEFATTING" OF THE ACID-FAST BACILLI OF LEPROSY AND TUBERCLE BY INJECTIONS OF CHAULMOOGRATES AND MORRHUATES.

BY

SIR LEONARD ROGERS, M.D., F.R.C.P., F.R.C.S., F.R.S., I.M.S.(RET.).

IN 1916 I recorded favourable effects in leprosy from the subcutaneous and intravenous injection of soluble sodium salts of the unsaturated fatty acids of chaulmoogra oil, sodium gynocardate, and hydnocarpates[1] [2]; in 1917 I pointed out[3] that even small doses given intravenously may produce softening of the nodules, accompanied by breaking up and absorption of the lepra bacilli; these changes were illustrated by coloured plates. In 1919 I recorded similar results from sodium morrhuate, prepared on similar lines from cod-liver oil,[4] and a year later with sodium soyate from soya-bean oil (to which Dr. E. Muir has since added ethyl esters of linseed and olive oils), and I showed that prolonged treatment by these methods may produce disappearance of the lepra bacilli from the tissues with apparent cures, which have now lasted in some cases for from five to eight years. I showed also that occasionally severe cases of leprosy cleared up in the course of some months following a prolonged febrile reaction, with great destruction of the bacilli, after a small intravenous dose without any further treatment, indicating that the dissolved bacilli have acted as an antigen in producing active immunity. In 1920 I reported some favourable results in the treatment of tuberculosis, mostly of the surgical form, with sodium morrhuate. In 1921 I summarized the results of my six years' researches,[5] and discussed the probable mode of action of these preparations, pointing out that the direct action theory of E. L. Walker and Marion Sweeney[6] (based on their demonstration of a specific action of gynocardates and hydnocarpates on acid-fast bacilli as a class) would not explain the efficacy of sodium morrhuate and soyate nor the prolonged improvement after a single febrile reaction, and I concluded:

"Such cases appear to be best explained on the theory that, during the extensive breaking down of the bacilli, antigens are formed, which bring about the subsequent prolonged improvement. I have for long considered that the action of the soluble salts of the fatty acids of the several oils I have shown to be effective in leprosy must, in some way, be due to a chemical reaction with the fatty acids in the coating of the acid-fast bacilli, so weakening their protective envelopes as to allow the body-cells to deal with them, while the extensive breaking down of the bacilli in the body may lead to immunizing antigen formation in the system. Whatever the precise explanation may be, it is now abundantly clear that my discovery, that injections of soluble preparations of the fatty acids of chaulmoogra, cod-liver, and soya bean oils lead to breaking down of leprosy bacilli in the human body, is of great interest and importance, and one which demands much further research."

The precise manner in which the dissolution of lepra bacilli in the tissues is brought about remained to be elucidated, but in 1920 Dr. J. A. Shaw-Mackenzie[7] recorded experiments showing that the addition of sodium gynocardate, sodium morrhuate, and sodium oleate to a pancreatic extract doubled the fat-splitting effect of pancreatic lipase on an emulsion of olive oil *in vitro*, and he suggested "a direct stimulating action of tissue lipolysis in, at any rate, partial explanation of the therapeutic effect of sodium morrhuate and of sodium gynocardate" on acid-fast bacilli. It then occurred to me to investigate the possible effect of these preparations on the blood lipase in both leprosy and tuberculosis, for it is known that this ferment is deficient in many tuberculous cases, and during the past year I have been working at this point in the biochemical laboratory at St. Bartholomew's Hospital, with the kind permission and help of Dr. Mackenzie Wallis, the preliminary results of which appear to be worth mentioning in view of the interest aroused by Professor Dreyer's important researches on "defatting" of tubercle bacilli *in vitro*.

Thanks to the kindness of Dr. E. Muir, Leprosy Research Worker, Calcutta School of Tropical Medicine, in sending home to me in ice a considerable number of serums of treated and untreated lepers, I was able to find that in three untreated nodular lepers the blood lipases averaged only an equivalent of 0.033 decinormal sodium hydrate, while the average of nine treated cases was 0.22, or about the normal figure; one of them, who had just had a severe febrile reaction with extensive destruction of the bacilli, however, showed a low lipase content, as if the ferment had been used up in dissolving the organisms. Dr. Muir has since made a large number of lipase estimations in lepers in Calcutta, and he has recently reported to me that "we are finding almost invariably a very low lipase content in severe reactions, and we are finding a good prognosis justified when there is a high lipase content."

I have also been making lipase estimations in a number of serums from surgical cases of tuberculosis kindly sent to me by Dr. Pugh and Dr. Mawson from the Carshalton Children's Hospital, and Dr. Mawson has recently sent me records which indicate that patients with low lipase content are usually those who are not doing well. I am also testing serums before and after treatment by chaulmoogrates and morrhuates at Carshalton, and also, through the kindness of Dr. Rundle, at the Fazakerley Sanatorium of Liverpool, to see if the lipases are raised by these drugs. It is too early to report the results, but those already obtained in leprosy appear to support the view that this class of preparation acts by increasing the blood lipase, which in turn dissolves the fatty coating of the acid-fast bacilli of leprosy, and probably also of tubercle, setting free the antigens, with resulting production of immunity in the system in leprosy, and possibly also in tuberculosis. In the latter disease, however, it is more difficult to control the process with sufficient accuracy to prevent too great liberation of toxins, in pulmonary affections at any rate. In other words, I appear to have obtained in leprosy, and possibly in surgical tuberculosis, "defatting" of the causative bacteria *in vivo*.

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A PAN-RUSSIAN Odontological Congress will be held at Moscow from September 4th to 11th, when the subjects of discussion will include the chemistry and surgery of the buccal cavity, single and compound prothesis, caries as a social disease, industrial diseases of the teeth and buccal cavity and the means of combating them, provision of dental treatment, statistics of diseases of the teeth and buccal cavity, and post-graduate courses.

THE fifth Italian Congress of Medical Radiology will be held at Palermo, under the presidency of Professor Gioacchino, from October 18th to 21st, when the following subjects will be discussed: *X*-ray treatment of skin diseases, by Professor Rossi of Parma; pneumo-radiography, by Professor Gortan of Trieste; radio-diagnosis of the urinary system, by Professor Boidi Trotti of Turin. An excursion will be made to Taormina and Syracuse. The subscription, 25 lire, should be sent to Dr. Sgroi Salvatore or Professor G. Scaduto, via Alloro 58, Palermo, before September 1st.

Observations
ON
FIFTY CASES OF CARCINOMA OF THE CERVIX TREATED WITH RADIUM.

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NATURE OF THE RESEARCH.

IN June, 1921, the Medical Research Council offered to lend St. Bartholomew's Hospital 324 mg. of radium bromide, to be used solely for the purpose of research.

The hospital authorities gladly accepted this offer, and formed a Radium Committee, which decided that one of the investigations to be carried out should be "the study over a prolonged period of the clinical and pathological changes produced by the action of radium, applied locally, in cases of carcinoma of the cervix." The object of the present paper is to record the results of the work done in this connexion during the last eighteen months.

In carrying out this research, both as regards clinical and histological observations, it was decided not to attempt more than to record the changes produced in the local condition and in the chief clinical symptoms, together with those histological changes which were easily recognizable and lent themselves to more precise classification.

Irradiation of Cervix.

Radium.—The radium available consists of the following:

(1) Two platinum tubes with walls 0.5 mm. thick containing respectively 53.1 and 54.2 mg. radium element. The outside dimensions of the tubes are 4 mm. in diameter and 34.8 mm. in length.

(2) Thirteen platinum needles with walls 0.4 mm. thick, each containing on the average 5.1 mg. radium element. The average outside dimensions of the needles are 1.8 mm. in diameter and 23.5 mm. in length.

(N.P.L. measurements corrected for platinum containers.)

The two tubes, filtered with aluminium, are placed end to end in the cervical canal, and the thirteen needles inserted into the cervical tissue at some distance from the canal and in a circle round it. On a few occasions, the needles before insertion were dipped into sterile Indian ink and allowed to dry. This procedure serves to leave a mark along the track of the needle.

Dosage.—The cases are divided into two series. In the first the quantity of radium element varied between 133.3 and 173.6 mg. radium element, the duration of exposure being eight hours. In the second, with one exception, the amount of radium element was 173.6 mg. and the duration of exposure was twenty-four hours.

Filters.—The filters employed in the case of the tubes consisted on most occasions of (1) a platinum container, which is 0.5 mm. thick; (2) a covering of aluminium; in the case of the needles, on all occasions the platinum container, 0.4 mm., was the only filter.

Sterilization of Radium and Filters.—This was carried out by boiling, the use of soda being avoided.

Irradiation of the Iliac Glands.

To this end the technique of Daels (of Ghent) was employed. For details of this operation, see a short paper written by one of us (M. D., *Proceedings of the Royal Society of Medicine*, 1922, pp. 67-70.)

HISTOLOGICAL INVESTIGATIONS.

Method.—In undertaking the histological investigations it was considered essential to examine sections of the growth before irradiation and as often after irradiation as circumstances would permit, so that comparative observations could be made from time to time. Owing to the anatomical situation of the lesions there was no difficulty in obtaining at frequent intervals fair-sized portions of the material for examination in the form of "snippings." Further, we were able to obtain from some of these cases the whole uterus, appendages, and glands by operation, or, as in two cases, at autopsy.

Technique.—Formalin was employed for fixation in the earlier cases, but later Zenker's fluid was substituted. Efforts were directed to placing the material in the fixative as soon after it had left the body as possible, and to cut it up into as thin slices as could conveniently be made. Sections were embedded and cut in paraffin, the usual technique being employed. As a routine staining, haematoxylin and eosin were used, but where special nuclear detail was required, the sections were stained with iron haematoxylin.

Results of Histological Examination.

In order that we might arrive at conclusions with the least possible bias, we made a careful analysis of our protocol, which was compiled without preconceived ideas as the sections came to hand.

I. *Eight-Hour Series.*

The observations in this series were made on cases examined at different times from one to sixty-two weeks after first irradiation (see chart); the majority of cases having more than one such application, and the dose varying between 133.3 and 173.6 mg. of radium element. The series comprises 14 cases of squamous-celled carcinoma. Of this number, 9 were examined both before and after treatment and are included in the chart. Growth was present in 8 after irradiation, and in the remaining case of the 9 (No. 8) a few cells of doubtful nature were found. Of the 5 not included in the chart, 2 were not examined before irradiation, and 3 did not present themselves for examination after treatment.

The material after treatment was obtained by hysterectomy in three (Nos. 5, 13, and 15) and at autopsy in two (Nos. 1 and 6), and by snippings in the remainder. Seven out of the nine received one irradiation before the second observation, and two (Nos. 2 and 8) received two irradiations, one of the latter being the case in which the only possible evidence of carcinoma was a few cells of doubtful nature.

Characters of Growth and Surrounding Tissues.

Certain of the main characters of the growth are mentioned here for comparison with the twenty-four-hour series, and will be found in more detail under that heading.

Cell Division.—In this series, 5 cases showed mitosis after irradiation; in 2 of these mitosis appeared more abundant than before; in 2 other cases mitosis had apparently disappeared after irradiation.

Large Nuclei.—These were seen in 3 cases, in one of which they were present before irradiation.

Small Round-celled Infiltration.—This was always found at the spreading edge of growth before and after irradiation, except in one case (No. 15) where it was absent after treatment.

Fibrosis.—This is not a marked characteristic in this series.

Encapsulation of new growth was not found in this series.

II. *Twenty-four-Hour Series.*

The observations were made on cases examined at different times up to forty-nine weeks after irradiation. The full quantity of radium was given on almost every occasion, the number of applications being two or more in the majority of cases (see chart). The series consists of 34 cases of squamous-celled carcinoma and 2 of columnar-celled carcinoma (Nos. 47 and 54), in which sections were taken both before and after irradiation. In addition, there were 2 cases in which no sections were taken before irradiation; and in 3 cases no sections were taken after irradiation, and thus are of no histological value.

In the 34 cases of squamous-celled carcinoma we were unable to find any growth after treatment in 22, and found growth in all stages of degeneration in the remaining 12. Two of these latter, however, contained bodies, for the most part structureless, but which appear to be the remains of new growth cells.

Twenty-two Cases in which no New Growth was found in the Cervix after Treatment.

From these the material was obtained by hysterectomy in 7 (Nos. 26, 27, 34, 36, 37, 45, 57), sections being cut at different levels. Four of these 7 cases were irradiated twice before the hysterectomy was performed, and 3 were treated once only before operation. In the remaining 15 cases, the material was obtained by "snippings"—in 14 cases after one irradiation, in one case after two irradiations.

Twelve Cases in which Growth was present in the Cervix after Treatment.

Growth was found to be present in 12 cases, but, as will be seen later, the amount of growth was considerably reduced. Further, the general microscopic appearances of the growth differed markedly from that of the original, and in some cases it was barely recognizable as such (Cases 22, 23, 33). All these 12 cases, with 3 exceptions, received one irradiation. Of the 3 exceptions, one (No. 24) received two doses before the second observation was made, the other 2 cases (Nos. 33 and 48) received one dose before the second and third observations respectively. Of these 12 cases, the material was obtained by hysterectomy in 4 and by "snippings" in 8.

Characters of Growth and Surrounding Tissues.

After irradiation, cases have been observed on the first day (that is, at the time of removal of radium), also on the second, fourth, and seventh days, and hence forward at varying intervals up to forty-nine weeks.

In the sections taken on the days immediately following irradiation considerable changes were noted. In some cases these were more marked than in others, probably owing to the proximity of the source of irradiation. In a section taken immediately after removal of radium the appearances were not dissimilar to those in the section taken before treatment—namely, normal mitotic figures were present in small numbers, and degenerate mitoses were occasionally seen. In a section taken on the third day, mitotic figures were much more numerous, normal prophase and metaphase were frequently seen, together with undoubted mitoses showing an irregular arrangement of chromosomes and occasionally multipolar-spindle figures. These changes were still more marked on the fourth day, when there was hardly a cell which did not show abnormalities of one kind or another. These abnormalities consisted of (*a*) Abnormal mitosis, (*b*) Necrosis, (*c*) Increase in size of the cell.

(*a*) *Abnormal Mitosis.*—No normal mitoses were seen; almost 50 per cent. of the cells showed absence of nuclear boundary and of these a large number showed degenerative mitoses. Prophase was occasionally seen, metaphase was abundant, but the later stages of division were not observed. Multipolar division was present, though not frequent, but cells showing granular and fragmented chromosomes were seen in large numbers. Some of them showed well formed spindle figures, but others showed only occasional scattered threads, the nature of which was doubtful, and we were unable to decide whether these latter cells were undergoing mitosis or were in a process of dissolution, especially as the cytoplasm of some of them was broken into droplets. In other cells, the chromosomes had almost entirely disappeared, the spindle figure alone being seen.

(*b*) *Necrosis.*—In some areas the tissue as a whole had undergone coagulation necrosis, there being complete loss of power to take up nuclear stain, while the general structure of the tissue was maintained. These areas, we believe, were in close proximity to the radium.

(*c*) *Increase in Size.*—The remainder of the new growth cells showed some increase in size compared with those in the original growth, and further, their nuclei were enlarged.

Later Changes.

From the seventh day onwards no mitoses of any kind were observed, an observation which would seem to be of considerable importance. The nuclei appeared to be broken up, the chromatin being distributed in the cytoplasm as droplets or irregular particles; in some cells, however, nuclear staining was no longer visible. After the first six weeks breaking up was less frequently seen, but when it did occur the nuclei occasionally assumed irregular and angular outlines, staining indifferently and unevenly, their appearance being more like that of an inorganic than of a biological substance.

In certain cases observed at a still later date the nucleus was no longer distinguishable, but masses of unorganized material, often concentrically laminated, were seen. These masses usually take up haematoxylin to a moderate extent. They are stained deep blue by a well matured Nile blue solution and red with mucicarmine, especially with regard to their outer laminations.

CHART OF HISTOLOGICAL CHANGES.

Case No.	Weeks after First Dose— 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24...49	Method of Obtaining Section.
Squamous-celled Carcinoma : 8-hour Series.																									
1												(X)													P M
2				2																					S
4					0$_2$										(X)$_3$								0$_3$		S
5	0																								H
6		(X)																							P M
8			2																	?N$_3$					S
13	(X)																								H
15	0																								H
16											(X)$_2$														S
Squamous-celled Carcinoma : 24-hour Series.																									
14															$_2$								N		S
17												N$_2$						N$_3$							S
18																		N$_2$							S
20													N$_2$												S
22									[↕]						[↕]$_2$									[↕]	S
23										X															S
24							2																		H
25														N$_2$											S
26								N$_2$		N															S H
27				N																					H
30					N$_2$																				S
31			X																						H
33				X$_2$					[↕]																S H
34								X$_2$																	S H
35				X$_2$																					S
36										N$_2$				N											S H
37							N$_2$						N												S H
38								N$_2$																	S
39								X$_2$																	S
40							N																		S
42						X$_2$																			S
43					N$_2$																				S
41				N$_2$																					S S
45			N																						H
46	XX$_2$																								S S
48								(X)																	H
50					X$_2$																				S
51									N																S
52														N$_2$											S
53				N$_2$																					S
55												N$_2$													S
56							N$_2$																		S
57				N																					H
Columnar-celled Carcinoma : 24-hour Series.																									
47	X				X																				S H
54							X																		H

N.B.—Some cases are omitted from the above series because the patient refused further examination, and a few because no section was obtained before treatment.

Explanation of Signs.—0 = No change found. (X) = Slight changes found. X = Marked changes found. [↕] = Growth scarcely recognizable. N = No growth found. P M = Section obtained *post mortem*. H = Section obtained from hysterectomy. S = Section obtained from snipping. The small figures 2 and 3 denote date of second and third doses respectively.

For amount of radium used see text.

Large nuclei were observed in 3 cases and were usually accompanied by a great increase in the amount of cytoplasm. They were deeply staining and had irregular and often "blurred" outlines. Although such nuclei are occasionally observed in untreated growths, and were undoubtedly seen in one of these cases, yet there is no question that they occur much more frequently after irradiation.

Small round-celled infiltration to a greater or less amount was always found before irradiation at the spreading edge of the growth or between the finger-like processes. In sections taken nine weeks after treatment it was still found, but later than this was no longer present. It is remarkable that the absence of small round-celled infiltration seems to correspond with the presence of the later type of nuclear change mentioned above.

Polymorphonuclear cells were usually found in a breaking down core of a growth, whether it had been irradiated or not. They were seldom seen at the spreading edge of the growth, except in relationship to an ulcerated surface. Occasionally polymorphonuclear cells were seen included in a new growth cell before irradiation, but on three occasions, varying from three to five weeks after treatment, this intracellular invasion was a prominent feature.

Fibrosis was found to be increased in all cases after treatment, especially near the position previously occupied by the radium, as shown by the Indian ink preparations. In the early stages there is a greater number of fibrous tissue cells between the muscle fibres independently of the proximity of new growth. As time continues muscle strands are less frequently met with and may be seen separated by masses of fibrous tissue fibrils. In the later stages no muscle at all, nor nuclei of any cells, are seen, but the micro-anatomical structure of the uterus and its vessels—the latter being by this time thrombosed—is to be seen formed of a quantity of dense fibrous tissue in which relatively few elastic tissue strands are incorporated.

Encapsulation.—There was little or no attempt at the formation of fibrous capsules round the growth before irradiation. This was also the rule after irradiation in those cases observed before the eighth week; but in five cases observed on six occasions—at the eighth, ninth, tenth, fifteenth, and forty-ninth weeks respectively—there was a definite sheath of fibrous tissue encircling the growth islets. It is not clear whether this formation is a purposeful reaction on the part of the tissues or whether it is simply a mechanical arrangement of the fibres. It is to be noted that this period corresponds with the later type of nuclear change, and with the absence of small round cells.

Columnar-celled Carcinoma.

Columnar-celled carcinoma was found in two cases of the 24-hour series. These were irradiated on one occasion only before hysterectomy. Growth was found in these two cases five weeks and nine weeks respectively after irradiation. In both cases the amount was much reduced, and in the second case to such an extent that it was only found in small isolated islets after several sections had been searched. The changes were of a similar nature to those found in the squamous-celled carcinoma.

Analysis of Clinical Results.

A concise presentation of the clinical aspects of the cases seems to the authors to be a matter of some difficulty, for while a complete clinical note of each case might be of great value to those who are directly interested in irradiation, yet this is so cumbersome that it was considered that an analysis would be more acceptable to the majority of readers.

The analysis is based upon the effect of irradiation on the four cardinal signs and symptoms—that is, haemorrhage, discharge, ulceration, and induration—and also upon the effect on the length of life and general comfort of the patient, so far as can be estimated at the present juncture.

As the immediate object in view is to show the effect of irradiation on the cervix, those cases in which hysterectomies have been performed are necessarily omitted from this analysis, but are included in the histological investigations.

Analysis of 8-hour Series.

Reviewing first the 8-hour series, we find that there were 14 cases treated, and of these 5 had hysterectomies performed, leaving 9 inoperable cases for analysis, but detailed information of subsequent history could not be obtained from 3 of these.

Length of Life.—Of these 9 cases, 2 (Nos. 4 and 8) have been treated for twenty and eighteen months respectively, and are still living. One of these cases (No. 4) is extremely well, and able to do her daily work; in her own words, she "has taken on a new lease of life." On vaginal examination it is found that the walls have become densely adherent, making it impossible to see the cervix. Per rectum there is some thickening to the left and to the front of the rectum. It is doubtful whether this is fibrous tissue or new growth. This patient, however, was found to have a fresh nodule of growth in the vagina after fifteen months. This was treated with 66.3 mg. of radium element for 24 hours, and at the same time deep irradiation was done by Daels's method. The second patient (No. 8) was very much improved for fifteen weeks, but is now not doing well, and when last heard of was rapidly going downhill. Of the remaining 7, 1 lived three, 1 sixteen, and 2 nine months respectively; 1 died of septicaemia within a few weeks of the insertion of radium, and 2 were notified as having died about four months after treatment began.

Haemorrhage.—Of the 5 cases in which this symptom was noted, haemorrhage ceased entirely after treatment in 4, and in 1 the amount was diminished.

Vaginal Discharge.—This cleared up entirely in 1 case, and was diminished in 4.

Ulceration.—This cleared up entirely in 2 cases, was diminished in 2, and remained the same in 1.

Induration.—It is always difficult to gauge how much of the induration present is growth and how much fibrous tissue caused by infection or as a result of treatment. In no case has the induration entirely cleared up, but in 1 case it was markedly diminished, in 2 somewhat diminished, in 1 somewhat increased, and in 1 remained the same.

Summary.—Two cases were decidedly improved, 2 cases slightly improved, in 4 cases there was no alteration, and 1 case died shortly after treatment.

Analysis of 24-hour Series.

Reviewing now the 24-hour series, one finds that 41 cases were treated, and of these 13 had hysterectomies performed, and 2 of the remaining cases have been treated so recently (within three months) as to be of no value in discussing results. This leaves 26 inoperable cases for analysis in detail.

Of these 26, 10 have died, 1 could not be traced, 15 are still living after periods varying from four to sixteen months, and in 7 of these treatment was commenced more than twelve months ago. Of these 15, 4 are deserving of special remark. One (No. 49) was treated with deep x rays by Dr. Finzi after one application of radium. Another (No. 23) is extremely interesting. After one application, she was considered to be too advanced for further treatment. It was, therefore, a very great surprise to find that six months later she had entered another department of the hospital and had undergone an operation for gall stones. Some months after the treatment she developed a vesico-vaginal fistula, the edges of which are at the present time composed of healthy-looking epithelial tissue. She is still alive more than twelve months after treatment and appears to be in good health. One case (No. 21) is still living after sixteen months, and feels extremely well; the local condition shows the vagina walls to be somewhat adherent, but on separating these the cervix is revealed as an atrophied nodule of fibrous tissue. There is some induration in the fornices. Another (No. 17) has been under treatment for thirteen months, is extremely well, and doing her daily work. Of the remaining 11, the majority were markedly improved for a time, but some now seem to be on the downward grade. Of the 10 who died the term of life after treatment varied up to fourteen months. In nearly every case the patient had a considerable amount of growth in the parametria

tissue and glands, which in 2 cases caused intestinal obstruction.

Haemorrhage.—This symptom almost invariably yields to treatment, and we find that it usually ceases within a week or so of the first irradiation. It ceased entirely in 22 of the 25 cases; in 2 others it was absent for a time but recurred. In 1 case it was diminished.

Vaginal Discharge.—In 11 cases discharge disappeared entirely; in 2 it ceased but recurred, and in 12 it was not diminished.

Ulceration.—In 10 cases ulceration cleared up entirely; in 2 it disappeared entirely but recurred; in 6 cases it was diminished, but never entirely disappeared. No change took place in 7 cases.

Induration.—Induration was markedly diminished for a time in 1 case. This was the one referred to above, which was treated by Dr. Finzi by means of deep *x* rays. Induration was slightly diminished in 3, markedly increased in 3, and not altered in 17. In 1 case it was markedly diminished for a time but increased later.

Summary.—Of the 25 cases traced, 13 are still living, and 3 remain well after more than a year. Definite improvement was made in 13 cases, slight improvement in 10; in 1 treatment seemed to have no beneficial effect whatever, and in 1 pain was actually increased.

Discussion of Results.

The present-day knowledge concerning the action of irradiation and results hitherto published appear to the writers to be quite inadequate to justify any discussion as to the relative merits of this form of treatment as compared to operation, and the majority of people in this country agree that at present radical operations should be performed for carcinoma of the cervix wherever that procedure is possible, whether or not irradiation is employed in addition. Nevertheless, the most optimistic of surgeons cannot but deplore the small number of cases that can be said to be cured, considering the prevalence of the disease. It is therefore essential that we should no longer resign ourselves to this hopeless state of affairs, but should investigate fully any method which offers hopes of bettering the present conditions. It must be remembered that the treatment by irradiation is, comparatively speaking, in its infancy, and therefore, in spite of the promising nature of the results so far obtained, we must not, at present, expect to effect permanent cures. As has been seen, certain changes, such as the local disappearance of the growth, cessation of haemorrhage, diminution of discharge, and healing of the ulceration, have been observed, striking differences having been noted between the 8- and 24-hour series. These facts promise to be of value in helping to discover the laws governing the biological effect of irradiation, without the knowledge of which it is extremely improbable that any true progress in the treatment is likely to result.

Histology.

Before discussing the histological results in detail, it is necessary to bear in mind certain preliminary considerations.

First, it is usual to find in untreated carcinoma a greater or smaller number of cells undergoing degenerative changes; but whilst it might seem that these changes would vitiate the conclusions arrived at on the effect of the irradiation, yet a careful comparison of the sections before and after treatment will leave no doubt that these are due to the radium.

Secondly, a series of "snippings" in any one case may differ from one another, because the conditions of sepsis, blood supply, distance from the situation previously occupied by radium, and relation of surrounding tissues are not the same for each successive piece taken. Nevertheless, if all the changes observed trend in the same direction, it is impossible to believe that they are due to any such chance causes. Further, in the 8-hour series no striking differences were observed after treatment, except in one case, whereas in the 24-hour series a very different state of affairs exists.

Thirdly, in those cases where growth is absent after treatment it is possible that it may not have been included in the material obtained. The fact, however, that growth was always present after treatment in the 8-hour series (except possibly in one case), and absent in over 60 per cent. of cases in the 24-hour series, makes it extremely improbable that this can often have occurred.

The quantity of radium in most of the cases has been kept a constant factor. The time of application has been eight hours or twenty-four hours in the two series respectively, so that the amount of irradiation of the tissues in the two series is in the proportion of 1 to 3. Marked differences were obtained in the two sets of cases, and we are of opinion that irradiation for eight hours is wellnigh useless, even if repeated on as many as three occasions; whereas even one exposure for twenty-four hours has a very marked effect, and has not infrequently led to the complete local disappearance of the growth.

Although it is impossible to obtain accurate measurements of the energy at any one point in the pelvis, owing to the method of distributing the radium, yet it is obvious that the energy received by all parts of the cervix must be of very great intensity compared to that received by the iliac glands, where the action of the inverse square law comes into play. Consideration of these facts explains why no growth can be found in the cervix, but is present and apparently unaffected in the iliac glands.

The only change after treatment which can be shown to have any degree of constancy in the 8-hour series is the appearance of large cells containing large deeply staining nuclei with irregular outline. This has been seen only in the first and second weeks after irradiation, and is probably to be regarded as a degenerative process.

In the 24-hour series the most striking change is the disappearance of the growth from the cervix in over 60 per cent. of cases of squamous-celled carcinoma. As is to be expected, this does not take place immediately; the earliest date on which it was observed was three weeks after irradiation, and this was in a case where the whole uterus was examined. It is not possible to say how long carcinoma cells can persist after treatment, but it is interesting to note that evidence of new growth débris was present in a section taken forty-nine weeks later. In those cases where new growth can yet be found, it is present in greatly diminished amount and shows marked degenerative changes. Consideration of these cases leads us to frame a tentative hypothesis of the stages through which the cell may proceed to its doom.

In discussing the sequence of events it is necessary to bear in mind the physical conditions present in the irradiated area. The cells closest to the radium receive the greater amount of energy, and those further away receive less, both because of the increase in distance and because a certain amount of energy has already been absorbed. When a large amount of radium such as we have used is left *in situ* for twenty-four hours it seems as if the radiations were sufficient to cause immediate death of all the cells in close proximity, thus giving rise to the picture of coagulation necrosis, which in turn disappears within a few days as the débris is removed. In the zone beyond this the irradiations do not seem to have an immediate lethal effect, but about the third day the cells show a breaking up of the chromatin into droplets accompanied by an enlargement of the cell itself, and sometimes by a breaking up of the cytoplasm into a number of small masses. Still further beyond this zone a large number of cells show marked activity on the third and fourth days. Mitoses are much more frequent than in the original growth, but they are almost entirely of a degenerate nature. They may be multipolar or may show granulation and fragmentation of the chromosomes, or the chromatin may have disappeared from the cell leaving only the spindle figure. The observations on which we have based this hypothesis of the stages in the first four days is in accordance with those published by A. Lacassagne and O. Monod (*Arch. Franç. Path. Gén. et Exp.*, 1922, Fasc. I, p. 28), but we are not so far in entire agreement with regard to his interpretation that the *principal mode* of death is degenerative mitosis. When discussing the matter with M. Lacassagne, he pointed out that there

was a considerable difference in the technique of irradiation employed by him, which fact may account for our interpretation. We are, however, further investigating the changes that occur within the first few days.

From the seventh day onwards there is apparently no attempt at multiplication by mitosis, and we have no evidence that multiplication in any form takes place. The nucleus, on the other hand, assumes strange forms; there is often an increase in size accompanied by an increase in cytoplasm and sometimes very large forms are seen. The outline is irregular and the nucleolus is often deeply stained. Later mottling or even vacuolation (sometimes the vacuoles are of large dimensions) is seen, followed in some places by a gradual loss of staining power whilst the nuclear form is still maintained. The cytoplasm itself is usually increased in quantity, and occasionally shows vacuolation. The tissues around are heavily infiltrated with small round and plasma cells, as before treatment, and in addition there is usually an increase in the amount of fibrous tissue. These appearances last up to six or eight weeks, towards the end of which time the cells, if they have not already disappeared, become difficult to find owing to their paucity. After this stage it seems that the cells entirely vanish from the tissue, except in a few cases where another process seems to be at work, which for want of a better expression we have termed "embalming." Whereas in the former case the cells seem as if they were dissolved and their remains removed, in the present case they appear to remain collected together in their original alveolar forms. The nuclei are sometimes to be recognized by their spherical outline and staining properties, but generally, and especially in the later observations, no nuclear structure is to be seen, and the islets consist of an unorganized mass, often concentrically laminated. These can only be regarded as remains of new growth because (1) they are bodies entirely foreign to the normal cervix; (2) they can be traced in a series of cases through the various stages from unquestionable carcinoma. In this embalmed state there is an entire absence of round-celled and plasma-celled infiltration around, suggesting that the growth is no longer capable of causing cell reaction, and is dead. The islets are often embedded in a mass of dense fibrous tissue or may have muscle tissue in close proximity, but usually there is an attempt at fibrous tissue encapsulation round them. From their staining properties these masses appear to be heterogeneous, but there is evidence that their outer portions contain myxomatous material.

Judging from the observations in one case which was examined fifteen and forty-nine weeks after irradiation, it would seem that when once the cells have reached this advanced stage these masses appear to be relatively permanent.

Conclusions.

Clinical.

1. These are in accord with the general experience of others in recent years, that in the majority of cases patients suffering from carcinoma of the cervix cease to have haemorrhage, vaginal discharge, and ulceration after treatment with radium. Further, that in some of those cases which are inoperable, life is prolonged and the patients are enabled to lead useful existences. It would be premature at the present juncture to talk of cures.

2. That the preliminary application of radium in those cases which are operable causes the disappearance of fungating growths or ulcers, so that the risk of infection and of implanting new growth from the cervix at the time of incising the vagina wall is markedly diminished.

3. There is no doubt that the application of 173.6 mg. of radium element for twenty-four hours is markedly more efficient in bringing about this result than the same amount applied for eight hours, even when the latter is given on as many as three occasions.

4. That since histological evidence of the efficacy of Daels's method of irradiation of the pelvic glands is impracticable its value is still *sub judice*, as it depends upon clinical evidence.

Histological.

1. That the introduction of 173.6 mg. of radium element into the cervical tissue for twenty-four hours is capable of causing a complete disappearance of the growth from the cervix within a few weeks, whereas the same application for eight hours produces little or no effect in the quantity or appearance of the growth.

2. That definite series of changes in the carcinoma cells can be demonstrated after irradiation, leading up to the destruction of the cell.

3. That little or no effect has been produced in affected iliac glands when the cervix is irradiated.

4. That as changes in the malignant cells take place before the formation of fibrous tissue, the latter is not the causal agent in the disappearance of growth.

5. That the carcinoma cells are more vulnerable than the uterine musculature, but that in the latter local atrophy and fibrosis take place at a later date.

Our thanks are due to the Medical Research Council and the Radium Committee of St. Bartholomew's Hospital for the facilities given us in carrying out this research; to Dr. Williamson and Dr. Barris for allowing us to irradiate some of their cases and to include them in this series; and to many others for their valuable assistance, but especially to Dr. T. S. P. Strangeways for the whole-hearted manner in which he has given us his assistance and advice.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE TONGUE SYMPTOM IN ABDOMINAL SEPSIS.

I would like to call attention to a symptom which I have been accustomed to seek in all cases of abdominal disease, and which has not once failed me during many years of practice. I refer to a definite smell in the tongue, which I find present in all cases where pus is present in the peritoneal cavity. I do not refer to the smell of the breath but of the tongue itself. I find the smell varies from the distinct smell of pus to an actual faecal odour, sickening to the observer.

I am unable to find any reference to this symptom in books on surgical diagnosis, but have notes on cases extending as far back as twenty-five years in which I have used this symptom and verified its accuracy by operation. We know how rapid is the absorption from the peritoneum, and it appears to me that the tongue gives the first indication of this absorption. Among many cases of which I have notes I mention only three.

Case 1.—A female child had pain in the appendix area, and was sent into a nursing home at once. The temperature was not raised. There was slight rigidity of the abdominal walls. No vomiting. I noted that the tongue smelt very offensively. Operation at once. Perforation of adherent appendix, with offensive fluid in peritoneal cavity.

Case 2.—Adult, male. History of two days' illness. Pain not severe. Slight rigidity of abdominal walls. Temperature raised. Tongue smelt faecal. Operation at once. Appendix gangrenous; pus and gas in the peritoneum.

Case 3.—Seen in consultation. Adult female. History of obscure pain in left side of pelvis. Definite swelling extending upwards for three inches above iliac crest. Per vaginam tense swelling to left of uterus. The tongue very offensive. Gave advice for immediate operation as I was sure that there was pus in the peritoneal cavity. Operation two hours later. On opening the abdomen in the middle line we found a large collection of pus walled off. The pus had originated in the left broad ligament and ruptured into the peritoneal cavity, becoming walled off by adhesions. Over twenty ounces were evacuated. Recovery was uneventful.

I have tried testing this symptom by getting the patient to gargle and wash out the mouth, but in every case the smell of the tongue remained. In most cases I have noted that the tongue was not covered with fur; usually it is dry and beefy-looking.

I would be very interested to know if others have observed this symptom, which I have learned to rely upon with much confidence.

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British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

ASSAM BRANCH.

At the annual general meeting of the Assam Branch of the British Medical Association, held at Haflong on January 7th, with Dr. WINCHESTER in the chair, a number of interesting papers were read.*

The Health of the European Community in Assam.

The CHAIRMAN read a paper by Dr. C. E. P. FORSYTH, entitled "Notes on conditions affecting the health of the European community in Assam." Dr. Forsyth was of opinion that prior to the engagement of a young assistant for work in Assam tea-gardens, expert medical examination at home was essential. While sufferers from the more obvious disabilities had not been engaged to any great extent for tea-garden work, yet it had been different in the case of those affected with, for example, the minor psychoses, and Assam was no place for the treatment or cure of "shell-shock" or similar conditions. Dr. Forsyth considered that tea companies should not, unless in exceptional circumstances, engage married men new to the country as assistants, nor should directors permit marriage until a man had at least completed his first five years, when he should be in a position to decide for himself. Women withstood life in the tropics or subtropics much less easily than men, although conditions in Assam could, in a general way, compare favourably with those prevailing in many other parts of the East. The strain of life for women in Assam fell especially and prejudicially on the nervous system, and continued residence led to nervous irritability, insomnia, and neurasthenia. Infants did well in Assam, and flourished up to about the age of 3 years, and their removal to the hills in the rains was unnecessary. After the age of 7 or 8 the risk of physical deterioration and mental detriment was markedly great, and after that age home was called for. A certain amount of monotony in regard to food could scarcely be avoided, and alcohol other than a whisky and soda at sundown, or with the evening meal, was unnecessary and to be avoided. In regard to special measures against particular diseases, one important matter was the use of quinine as a prophylactic against malaria. Dr. Forsyth's opinion was that 5 grains of quinine given daily in all ordinary circumstances was the optimum prophylactic dose.

Progress of Kala-azar Work in Assam.

Lieut.-Colonel T. MCCOMBIE YOUNG, I.M.S., Director of Public Health, Assam, read a paper on the progress of kala-azar work in the province of Assam in general and in Sibsagar in particular. He said that Assam was for some unknown reason *par excellence* the home of kala-azar, while the terrors of bubonic plague were unknown. The older residents of Assam told gruesome stories of the appalling mortality formerly, and in the eighties and nineties epidemics of kala-azar swept up the Assam valley. For the last twelve years the importance of vigilance with regard to the prevalence of the disease had been urged by the Government health advisers, and as a result a touring staff of subassistant surgeons had been maintained to watch its activities during the quiescent period. In 1917 a new focus of the disease came to light in the Sibsagar subdivision, and in 1919-20 there was an extensive recrudescence of the disease in the endemic areas previously traversed. Providentially for Assam, treatment by the intravenous injection of tartar emetic had recently been introduced into India by Sir Leonard Rogers; in 1921 nearly 16,000 kala-azar patients were treated by this method, and in 1922 (excluding December, the returns for which had not yet been received) 16,778 patients had received treatment. Lieut.-Colonel McCombie Young gave details of outbreaks at Reoti-Kopohua and Hudupana, and expressed thankfulness for the introduction of intravenous tartar emetic. In what other disease, he asked, was there a 95 per cent. cure for a disease the mortality of which was otherwise 90 per cent.? During the present year the total of patients treated would be, he said, nearly 20,000, and Assam within the last two years owed to modern medicine and the Government organization which had placed that treatment within reach at least some 23,000 lives.

The Calcutta School of Tropical Medicine.

Major R. KNOWLES, I.M.S., Professor of Protozoology in the Calcutta School of Tropical Medicine, gave a lantern lecture on the school and its programme of research. Major Knowles detailed the early history of the school and its struggle for existence, and said that it represented and would ever constitute the finest memorial to the genius and the determined obstinacy of Sir Leonard Rogers. The completed scheme incorporated four separate but mutually dependent institutions, functioning under a single director as head: the School of Tropical Medicine proper, the object of which was post-graduate teaching and research work; the Institute of Hygiene, with which were incorporated the public health laboratories; the six special research laboratories, which were added to the scheme by public subscription and were financed by the Indian Tea, Jute Mills, and Mining Associations, the Indian Research Fund Association, and by public and private subscriptions; and finally, the Carmichael Hospital for Tropical Diseases, which at present held 98 beds, but which it was hoped to increase to 114 beds. In regard to kala-azar, co-operative work was being carried on by four departments. The most easily applied method of diagnosis was by spleen puncture, and in 463 consecutive cases of fever and enlarged spleen seen at the school, no less than 300 proved to be kala-azar on spleen puncture; much of the so-called malaria of Bengal was really kala-azar. In regard to treatment, the intravenous administration of sodium antimony tartrate was regarded as the sheet anchor; stibenyl had been found disappointing. The question of how kala-azar was transmitted from man to man was, in Major Knowles's opinion, the most puzzling and most important unsolved problem in tropical medicine. He believed that a domestic insect was concerned, and suggested, as those most worth considering, the bed bug, conorhinus, the flea, and the sandfly, but those were speculations only. Turning to the consideration of malaria, research work was being carried out by Major Acton in conjunction with Major Chopra. With regard to quinine treatment, the intravenous administration had the most rapid and the most immediate effect upon the clinical symptoms, but it did not prevent relapse and was not entirely free from risk; intramuscular administration had its uses, but administration by the mouth remained the most important method. The effects of the other alkaloids contained in cinchona bark were being studied, and Major Acton had already pointed out the value of quinidine in quartan and benign tertian malaria, in which it was six to ten times more efficacious than was quinine. The ordinary plain cinchona febrifuge, which consisted of the total alkaloids *minus* the extracted quinine, was a more effective remedy for malaria in general than was quinine. Much useful work was also being done in the school on the dysenteries, and the treatment of amoebic dysentery had become almost standardized. After the diagnosis had been confirmed the patient was given a six-day course of combined hypodermic and oral emetine; one grain of emetine was given each morning by injection, and, if the patient could tolerate it, two or three grains of bismuth emetine iodide in keratin or salol coated pills, preceded half an hour earlier by 1/6 to 1/8 grain of omnopon; after the sixth day the patient was taken off all treatment, except perhaps liquid paraffin for any constipation, and if clinically well he was discharged; but for at least once a week for eight weeks his stools were examined for *E. histolytica* or cysts, and, if necessary, the six days' course was repeated. Major Knowles also discussed the Indian dietetic diseases on which research was being done, such as lathyrism and the epidemic dropsy of Bengal; and the research work was described that was being carried on in ankylostomiasis, leprosy, tropical skin diseases, and indigenous Indian drugs.

* A full report has been published in the printed *Proceedings* of the Branch.

Reports of Societies.

SURGERY OF THE BILE PASSAGES.

A MEETING of the Section of Surgery of the Royal Society of Medicine was held on June 27th for a discussion on the surgery of the hepatic and common bile ducts. A report of Dr. WILLIAM J. MAYO'S opening paper appears at page 7.

Sir BERKELEY MOYNIHAN commenced his speech by paying a graceful tribute to the pre-eminence in the surgery of the bile passages of his friend Dr. William J. Mayo. Secondary, tertiary, or multiple operations upon the biliary system might be made necessary by a variety of causes. Chief amongst these were the nature and condition of the disease, its complications and remote effects, and imperfect primary operations. There were two factors bringing about the formation of stone—infection reaching the bile channels, and an increase in the cholesterol content of the blood. An infection might reach the gall bladder from several directions—from the blood stream, the bile, by the lymphatics, from the common duct, infected in its turn from the duodenum, or by contiguity. But such an infection might not be primary in the organ from which it was immediately derived. A search for infective lesions should therefore involve a scrutiny of the whole body. Failure to do this might mean a recurrence from stones in the gall bladder, the liver, or its ducts. Cholesterol was known to be present in excess in the blood in certain circumstances. In pathological conditions other than cholelithiasis or cholecystitis low or normal values were usually found. In uncomplicated cases of cholelithiasis the cholesterol blood content tended to be high. In 60 per cent. there was hypercholesterolaemia; although in the remaining 40 per cent. the cholesterol content of the blood was normal, in three-quarters of these cases high normal values had been obtained. In all cases of cholelithiasis a marked fall in the cholesterol content of the blood was observed after operation. In some cases re-examination afterwards showed a subsequent rise, sometimes progressive. These people were continuously hypercholesterolaemic; usually, however, after operation the cholesterol content of the blood fell to normal. It was the speaker's practice not to allow the following articles of diet after operation: Yolk of egg, brains, kidneys, sweetbreads, liver, goose and duck, pork and game, fat, stewed and fried meats, cream and cheese, fresh fruit and green vegetables (for three months), butter (only in small amounts if at all).

Recurrence of symptoms after operation might depend on a number of circumstances. Stones might be overlooked or left behind in any part of the extra-hepatic ducts, including the ampulla of Vater. Frequently the common duct was obviously, even grossly, dilated. The question of how best surgically to diagnose a stone in such a duct was one which surgeons answered differently. The enlargement of glands along the duct, the presence of large nodules in the head of the pancreas, might cause one to be almost confident that a stone was present. The speaker emphatically disagreed with the opinion that in such circumstances the duct should be opened and explored. A probe or even a small scoop could miss a calculus of good size, particularly if it were in a little pocket aside from the main channel of the duct. By far the best method of decision was to place the first and second fingers of the left hand through the foramen of Winslow and the thumb in front of it, and to palpate the duct and compress it between finger and thumb. To an expert hand the smallest fragment of stone would be apparent after the duct had been emptied of bile. When a stone concealed in the ampulla of Vater had been overlooked at the primary operation the duodenum should be opened and McBurney's or Kocher's operation performed. When it was not necessary to open the duodenum the dilatation of the lower part of the duct from above was a most useful procedure. It might be effected by the passage of probes of the type suggested by Mayo, or by the passage of a rubber catheter through the duct into the duodenum.

Another imperfection of operation was to provide inadequate drainage for the particles of grit which were sometimes left in the lower intrahepatic ducts or in the hepatic or common duct. He strongly disagreed with the practice of immediate suture of the duct after choledochotomy. In every case of obstruction of the common duct by a calculus there was cholangitis; often there was mud or sand in addition to the larger stones. With a large solitary stone of recent descent from the gall bladder immediate suture might sometimes safely be performed. He made it a rule to drain the hepatic duct in all cases of multiple stones. For patients who were gravely ill he often used the method of McArthur of passing a catheter down the duct into the duodenum for the purpose of giving liquid nourishment. Narrowing of the common duct was for the time overcome and drainage was effected. He gave through the tube 5 per cent. to 15 per cent. solution of glucose with a little sodium carbonate by the "drip" method, interrupting the steady flow every three or four hours to give a meal of peptonized milk, beaten eggs, etc. As much as ten to twelve pints of fluid might be introduced during the day; the tube remained in for ten days to a fortnight.

Irrigation of the intrahepatic ducts was sometimes necessary in cases in which the ducts contained great quantities of mud. If typhoid organisms were found in the bile the administration of urotropine by the "thump" method was advisable; 30 grains of acid sodium phosphate in one pint of water were taken during the day, and at night a single dose of urotropine, beginning at 30 grains and increasing to 60 grains, was given. At the end of a week a respite of a few days was allowed and alkalis given; the administration of urotropine was again commenced and again interrupted. In cases of primary cholecystectomy failure to divide the cystic duct at the proper place might be responsible for disaster. There were many anatomical variations. The inviolable rule in the surgery of the gall bladder and of the common duct was to "see exactly what you are doing, and until you see, do nothing." If a part of the hepatic or common bile duct was removed it should be immediately repaired. Sir Berkeley Moynihan considered the question of the operation of choice in a case of cholelithiasis with stones in the gall bladder and common duct. He advocated removal of the gall bladder at the time when the common duct was emptied of stones.

An important group of cases was that of involvement of the pancreas with cholelithiasis. Whether the infection reached the pancreas via the lymphatics or the common duct was still undecided. In any case, it was better to remove the gall bladder than to drain it. Cholecystectomy was beginning to displace cholecystenterostomy in the treatment of chronic pancreatitis. Cases sometimes occurred in which an enlarged, hard, oedematous head of the pancreas, by pressing on the common duct and compressing it, caused stagnation of the bile, cholangitis, and typical symptoms of calculous obstruction. In such cases the T-shaped tube of Kehr might be used to drain the hepatic duct intermittently; or better, two catheters might be introduced, one draining the hepatic duct and the other passing downwards into the duodenum and affording a channel for nourishment.

All the operations upon deeply jaundiced patients raised two questions—that of hepatic insufficiency, and of its avoidance, if such be possible, by an adequate preliminary preparation of the patient; and that of post-operative haemorrhage. The symptoms due to the failure of the liver were apt to come quite unexpectedly. The operation had perhaps presented no unusual difficulties, and the patient left the operation theatre in good condition. For a few days all went well; then one of two events attracted serious attention. The amount of bile discharged might suddenly diminish, or almost cease; jaundice deepened slowly; the pulse became slower; the mind was clouded; nourishment was sparsely taken or refused—when it was well taken vomiting began; the amount of urea in the blood steadily augmented, the patient grew rapidly weaker and died after a period of coma. In these cases, as Walters had shown, it was renal failure consecutive to hepatic failure that caused

death. Or the picture so well described by Walters and Parham might be seen:

"Clinical picture of hepatic insufficiency. Usually the first two to eight days after operation the course is uneventful; biliary drainage and urinary output are normal, fluids are taken well, the pulse and temperature are normal. One of the first signs of the onset of trouble is paling and thinning of the bile with marked increase in the flow. This profuse cholerrhagia does not continue long, but the bile remains thin. The patient begins to grow weaker, the pulse loses volume, and the temperature becomes subnormal. Restlessness and irritability develop, with great fatigue and muscular weakness. Soon regurgitant vomiting follows intake of liquids by mouth and little taken by rectum is retained. Jaundice does not deepen markedly, but there is an increasing pallor beneath the icteric hue, the face becomes drawn, and the eyes anxious. The patient grows progressively weaker and finally dies. The urinary output remains proportional to the fluid intake throughout, and the urine reveals little or no evidence of marked nephritis. The blood urea remains persistently low."—(*Surgery, Gyn. and Obst.*, 1922, xxxv, 605.)

Post-operative haemorrhage was due to the reduced power of coagulation of the blood, and this depended probably upon a lack of calcium salts. The deficiency of these was made good in two ways—by direct transfusion of blood or by the intravenous administration of 5 c.cm. of a 10 per cent. solution of calcium chloride on three successive days, as advised by Walters, and by Lee and Vincent. The giving of calcium salts by the mouth even in colloid form had little effect, when it had any, upon the calcium content of the blood. The coagulation time of the blood might be brought down to the normal or to the near neighbourhood of the normal by the intravenous administration, and the operation carried out at the appropriate moment. In all these cases it was necessary to administer as much glucose as possible by the mouth, and by the rectum; and at the operation to take every care to ligature the smallest vessels. It might sometimes be prudent to postpone the removal of the gall bladder because of the slow but unceasing weeping of blood from the denuded surface of the liver which sometimes followed upon cholecystectomy. Secondary operations upon the biliary system were among the most difficult tasks in surgery. To obtain the best results all the highest qualities of the surgeon were called into play: courage, resource, patience, accuracy and rapidity of judgement, fine craftsmanship, and a tranquillity of mind and action that nothing could disturb.

Mr. JAMES SHERREN's remarks were based on his personal experience in the operative treatment of 600 patients with gall stones, in 113 of whom the stones were in the common or hepatic ducts. He pointed out that these complications were due to a failure of efficiency in the earlier stages; they were usually entirely unnecessary complications of gall bladder disease. Save in very rare cases stones did not form primarily in the ducts. He did not believe that, in the operative diagnosis of stones in the common duct, palpation was enough. If the surgeon were suspicious of a stone in this position the duct should be opened. In operating for obstructive jaundice a two-stage procedure was recommended. In ordinary cases he advocated removing the stone or stones and the gall bladder. Prognosis depended on the presence and degree of jaundice and infection. Cholecystectomy for stone confined to the gall bladder had a death rate of less than 2 per cent. In the series of common duct cases in the absence of jaundice there was a mortality of 2.5 per cent.; with severe jaundice it was as high as 27 per cent.

Mr. G. GREY TURNER emphasized the need of great care in the performance of cholecystectomy—which had a direct bearing on the surgery of the common duct. The cystic duct ought never to be divided, he said, until both the hepatic duct and the common duct were seen, and during every such operation the removed gall bladder should be carefully examined, so that if there was any suspicion of the main duct having been injured the site could be exposed and the damage repaired while the lesion was fresh. Although some such injuries might fortuitously recover with restoration of function, in his experience the tendency was more often towards obliteration or stricture, and he gave notes of four such cases. Surgical literature had latterly been filled with accounts of operations for the restoration or reconstruction of the bile ducts, which was suggestive that these surgical injuries were more frequent than the published cases would lead them to suppose. In dealing surgically with the larger bile ducts certain facts had to be borne in mind. (1) The ducts were elastic and not only retracted when divided, but their ends actually contracted, thus favouring obliteration. (2) Except when fixed by inflammation they lay loosely among the tissues, which formed a natural sheath and protection for them. Haemorrhage and extravasated bile tended to be confined or conducted by these natural sheaths, and the former aided in the obliterative process. (3) The mucous membrane of the ducts had great recuperative power, tended to grow out along the duct, and was very helpful in bridging a gap or making up deficiency. (4) Ducts did not atrophy appreciably or become obliterated as a result of disuse—these were happenings which depended on inflammation. In the light of these considerations it was clear, he believed, that the most important point in the repair of ducts was to secure approximation of the ends, but not necessarily exact apposition. Too many sutures and too much nicety in suturing were very apt to cause narrowing. The suture line should be the widest part of the duct, and in order to secure this it might be necessary slightly to slit up one end of the duct. Any type of vertical incision through the rectus would give a sufficient exposure provided it was carried right up to the epigastric angle. The use of the Robson position had become well established, but the reversed Trendelenburg posture did not seem so well known, though it had proved very helpful. His experience had taught him that when there had been symptoms pointing to an obstruction or infection of the common duct the latter should always be opened. Small stones, soft stones, and detritus might very readily be missed if external palpation alone was depended on. He never concluded an operation on the duct without passing a sound, and he preferred the female bladder sound with a diameter of three-sixteenths of an inch, through the duct into the duodenum.

Mr. A. J. WALTON dealt with that difficult group of cases in which some form of reconstruction of the common bile duct was necessary. First came the case in which injury had been caused by an operation for cholecystectomy. The many variations in the origin and course of the cystic artery and in the length and position of the cystic duct were responsible for many errors. In the older days when it was more common to commence a cholecystectomy at the fundus of the gall bladder, the common bile duct might easily be pulled up in a loop by tension on the cystic duct and a portion completely resected. As the result of inflammatory adhesions, Hartmann's pouch of the gall bladder might be drawn down and firmly attached to the side of the common bile duct, and this again might be a source of error. The only way to avoid these mistakes was to make a very definite rule that in performing cholecystectomy an incision should first be made in the upper part of the gastro-hepatic omentum and that nothing should be divided until all three ducts were exposed. Congenital absence of the cystic duct was fortunately very rare. When a cholecystectomy was done with this condition present a portion of the common duct was necessarily resected. In early pancreatic disease there might be present obstruction to the lower part of the common duct, and this might in time demand some form of reconstruction operation. Advanced cases of chronic pancreatitis and carcinoma of the head of the pancreas might be associated with the presence of white bile in the gall bladder and passages. The danger in these cases lay in the fact that if the gall bladder were aspirated the condition might be thought to be an obstruction of the cystic duct, and the common duct opened to settle the diagnosis. Frequently this resulted in a permanent biliary fistula. Carcinoma of the common duct was rare, as also was scarring and fibrous stenosis at the junction of all three ducts caused by an impacted stone. The operations for relieving these conditions were numerous. Direct suture was theoretically best, but was frequently very difficult. Suture round a tube was often followed by fistula formation. Without a tube leakage was common and stenosis was likely to occur. Lateral choledochenterostomy was not entirely satisfactory. These operations were gradually being superseded by direct or indirect inplantation into the duodenum. Direct inplantation into the duodenum, where possible, was the operation of choice. The proximal end of the duct was brought down to the duodenum and

anastomosed to a valvular opening in the wall of the viscus. Without a valvular opening, which was sometimes difficult to make, there was danger of infection from the duodenum and a suppurative cholangitis. He strongly advised an operation of indirect inplantation in which a new duct was formed out of a flap of duodenum. This method might be used either when the duct was completely divided or for the formation of a new lateral duct when the original passage was simply dilated above an obstruction.

PEDIATRICS.

THE BRISTOL MEETING.

A PROVINCIAL meeting of the Children's Section of the Royal Society of Medicine was held at Bristol on June 22nd and 23rd, with Dr. ERIC PRITCHARD in the chair.

During the first afternoon a demonstration of cases was given at the Bristol Royal Hospital for Sick Children, and a large number of interesting cases were exhibited.

Dr. O. C. M. DAVIS showed the following cases:

(1) A girl, aged 17, with marked cyanosis, clubbing of fingers, easily provoked dyspnoea, and polycythaemia. There was no cardiac enlargement, no abnormal auscultatory phenomena, and "no enlargement of the spleen."
(2) A boy, aged 9½, with ichthyosis and congenital heart disease. There was a systolic murmur and thrill with maximum intensity at the aortic area, and slow pulse suggesting aortic stenosis.
(3) A girl, aged 3½, with congenital absence of iris in both eyes.
(4) Three cases of mongolism—two with malformation of the ears, and the third with congenital heart disease.
(5) A boy who suffered from encephalitis lethargica three years ago, now showing after-effects of the paralysis agitans type.
(6) A girl, liable to severe attacks of bronchial asthma after food indiscretions, greatly relieved by benzyl-benzoate.

Dr. R. H. NORGATE showed four cases of congenital syphilis, one of which exhibited mixed gonococcal and syphilitic lesions, and one, a boy aged 10 years, wasted, with irregular fever, a large heart, systolic murmur and thrill all over precordium, and some considerable splenic enlargement. The diagnosis in this case appeared to be one of congenital syphilis and congenital heart disease, with superimposed subacute bacterial endocarditis.

Dr. E. C. WILLIAMS showed three cases:

(1) A case of consanguinity—the child of a brother and sister—subject to violent tempers, backward, with a bad circulation, malformation of ear, and exhibiting other signs of mental degeneracy.
(2) A girl, aged 15, with fibroid phthisis.
(3) A boy, aged 12, with peroneal type of muscular atrophy. Eight years previously the child was alleged to have been knocked down by a tramcar; wasting of the muscles below the knees has since followed. There is now wasting of muscles below the knees, some talipes equinus, and wasting of the small muscles of the thenar eminence of both hands. The reflexes are normal except for loss of Achilles jerks. Sensations and sphincter are normal.

Mr. HUBERT CHITTY showed cases which included the following:

(1) A case of myositis ossificans affecting the left arm. Sections show true bone invading the fascia and deep layers of skin.
(2) Congenital dislocation of the shoulder, the loss of power to rotate the arm outwards being dealt with by osteotomy of the humerus.
(3) A case showing the result of ankylosing a flail-shoulder due to infantile paralysis.
(4) So-called late rickets. The osteotomy fracture in this case remained ununited for months, but union occurred after local injections of collosol magnesium.
(5) A girl exhibiting numerous malunited fractures and with malformation of the skull—namely, "persistence of frontal groove, large thinly closed anterior fontanelle." *X* rays showed defective calcification. This case was labelled osteitis fibrosa, but the consensus of opinion of those examining the case was that it was one of osteogenesis imperfecta.

Dr. RICHARD CLARKE showed an infant with loose skin at the nape of the neck and swollen hands and feet due to lymphangiectasis; another with many large hairy moles on the body, face, and limbs; and a case of achondroplasia.

Mr. WILFRID ADAMS showed two cases of ectopic testis, inguinal, treated by orchidopexy; a case of ectopic testis, perineal, and a case of absent radius—both with a view to suggestions as to treatment; a case of haemophilic knee; two cases of Erb's palsy and fractured humerus, treated and cured; and a child of 2 years and 4 months with an ovarian dermoid cyst, in which acute torsion had taken place, followed by operation and cure.

Dr. GEORGE HALL showed a child of 3 years with hemihypertrophy affecting both bones and soft parts of the whole of the right side of the body.

Mr. L. N. MORRIS showed a case of tuberculous disease of the hip with large abscess and disintegration of head of femur, cured by fixation and repeated aspiration; a case of osteomyelitis of lower end of femur, with secondary streptococcal infection of knee-joint; several cases of deformed feet illustrating end-results of tendon transplantation; and a case of median fistula of the neck.

Owing to the large number of cases exhibited there was no time available for a formal discussion, and the meeting adjourned to the University of Bristol, where three short addresses were given: (1) Acute nasal sinus disease in young children, by Mr. E. Watson-Williams; (2) The Schick reaction and diphtheria anaphylaxis, by Dr. J. A. Nixon; (3) The clinical significance of certain urinary conditions in children, by Dr. O. C. M. Davis.

Mr. E. WATSON-WILLIAMS showed two cases in which he had operated for acute nasal sinus disease, both patients being 3 years of age. The onset was sudden, a week after severe colds, with redness and swelling of the whole cheek, and fever. Teeth, normal.

Case 1.—Right nasal discharge of offensive pus. Antral exploration with suction syringe: Right side pus, culture streptococci; left side clear, culture negative. Right intranasal antral operation. Subsequent daily lavage—cure (shown three and a half months later).

Case 2.—Nasal discharge reported, none seen. Right antrum contained pus, culture streptococci; left antrum clear, but culture streptococci. Right intranasal antral operation. Temporary relief (two months), but relapse has just occurred with bilateral discharge.

In his paper Mr. E. Watson-Williams briefly reviewed the anatomy, frequency, symptoms, diagnosis, treatment, and literature of acute nasal sinus disease in children, and pointed out that one must separate the acute maxillary osteomyelitis of infants, in which the antral infection was a small part of a graver condition, from antral sinusitis resembling that of the adult. Most cases were not seen in the acute stage. Chronic nasal sinus disease in even young children was becoming recognized as by no means rare. Occasionally cases were found with acute symptoms of suppuration. In operating, the small size and high floor of the antrum must be remembered, as also the proximity of the dental germs. From these anatomical considerations exploratory puncture through the middle meatus was preferable to puncture through the inferior meatus.

Dr. J. A. NIXON, in his paper on the Schick reaction and diphtheria anaphylaxis, emphasized some of the drawbacks and difficulties which might arise in the performance of this test. He mentioned the fallacies that might arise from errors of technique and deterioration of test toxin. He discussed the question of interpretation of results, dividing these into frankly positive, frankly negative, and pseudo-positive and pseudo-negative. He pointed out that while as a general rule this test distinguished the susceptible from the immune, yet exceptions did occur in which cases giving a negative reaction developed diphtheria; while certain cases with sufficient antitoxin in the blood gave a positive reaction. He quoted also certain cases that clinically and morphologically had diphtheria but gave a negative reaction, and other cases which showed that immunization would not always protect against massive doses of infection. As an indication of the value of the test and of the immunity that might be acquired from inoculation with toxin-antitoxin, he gave the results of an examination of 201 members of the staff of a hospital which had been suffering from an outbreak of diphtheria. Of these, 77 were positive or pseudo-positive and were immunized with toxin-antitoxin; the remaining 124 were negative, and of these 18 had had diphtheria. After immunization only 4 cases contracted diphtheria, and 2 of these were almost immediately following their immunization. In answer to the President and other members, Dr. Nixon said the test was of no value in children under 5 years of age; that it could not be utilized in the detection of carriers, the identification of whom must still be dependent on careful examination of nose and throat swabs; and finally, that it gave no evidence as to the virulence or avirulence of any infection, the estimation of which must depend still on animal experiment.

Dr. O. C. M. DAVIS read some preliminary notes on a research which he had been carrying out for four years in conjunction with Dr. F. W. Rixon. The remarks made referred to a possible mathematical relationship between urinary acidity and combined ammonia, as determined by Folin's method.

The amount of decinormal alkali required to neutralize 25 c.cm. of urine, using phenolphthalein as indicator, was referred to as Titration I, and the further amount of alkali required to react with the acid liberated from the neutralized urine by a neutral solution of formaldehyde was referred to as Titration II.

$$\text{"R"} = \frac{\text{Titration II.}}{\text{Titration I.}}$$

Dr. Davis pointed out that there was clinical evidence to show that in certain pathological conditions (quite apart from ketosis) the value of "R" was increased, and he considered that it was to some extent a measure of the physiological activity of the liver of the individual under observation. He thought that there was little doubt that many adults and children when in good health could maintain a fairly constant magnitude for "R," whereas others seemed unable to do so.

Reviews.

NON-SURGICAL DRAINAGE OF THE BILIARY TRACT.

DR. B. B. VINCENT LYON, whose numerous reports on his method of draining the biliary tract by aspiration through a duodenal tube have excited much interest and discussion, has now collected his results into a volume of over 600 pages, entitled *Non-Surgical Drainage of the Gall Tract*.[1] His work on these lines began in April, 1917, and as the first of the series of papers appeared in September, 1919, much investigation was carried out before any conclusions were made public. The starting point of this method was the observation contained in Meltzer's paper in 1917 on the law of contrary innervation that by spraying the biliary papilla with a 25 per cent. solution of magnesium sulphate the tonic contraction of Oddi's sphincter at the lower end of the common bile duct is inhibited so that bile flows into the duodenum. Meltzer's further suggestion that by means of the duodenal tube the solution of magnesium sulphate could be applied and the bile then withdrawn and examined was elaborated and applied in practice by Lyon. In health the first bile thus obtained is of a light yellow colour, of medium viscidity, like syrup, and perfectly transparent; after the withdrawal of some 10 to 30 c.cm. of this "A" bile from the common duct, the bile suddenly deepens to a considerably darker golden yellow colour and becomes more viscid, and is thought to be the contents of the gall bladder. After a flow of 10 to 75 c.cm. of this so-called "B" bile there is a third transition and the bile is of a light lemon colour and is thinner and more limpid than either of the two previous specimens; this "C" bile is believed to come from the liver. These three kinds of bile can be received into separate bottles and examined microscopically, chemically, and bacteriologically so that a diagnosis of disease and of the infecting organism can be made. Lyon goes further than Meltzer in believing that magnesium sulphate causes contraction of the gall bladder as well as relaxation of Oddi's sphincter; this fits in admirably with the idea of contrary innervation.

These views have met with considerable criticism from Crohn, Bassler, and others, and Max Einhorn, the inventor of the modern duodenal tube (1909), argues that the changes in the colour of the bile are due to the action of the magnesium sulphate and are not indications of the site from which the bile comes. These objections to the fundamental principles of the method are answered at length by Lyon, whose book is intended to show that non-surgical drainage of the biliary tract is a practical procedure and within certain limits is of use both in the diagnosis and the treatment of some forms of biliary disease. A full account, copiously illustrated, is given of the technique of medical drainage of the biliary tract, which is elaborate, for special precautions must be taken to prevent contamination of the tube during its passage; the method is of value in the early diagnosis of biliary infection and of biliary stasis. It is held to have a wide field of usefulness in the treatment not only of mild cholecystitis and biliary stasis but also as an alternative method of treatment in many forms of gall-bladder disease in which the question of immediate surgical interference arises, and as a supplementary method of maintaining after operation the surgical principles of drainage in cases incompletely cured by surgical measures alone. As an example of its value in simple catarrhal jaundice it may be mentioned that the duration of the disease was reduced by 52 per cent. as compared with another series treated on ordinary lines. Many illustrative cases are given in full with instructive commentaries. The author must be congratulated on the results of his prolonged and successful work.

[1] *Non-Surgical Drainage of the Gall Tract.* By B. B. Vincent Lyon, A.B., M.D. Philadelphia and New York: Lea and Febiger. 1923. (Med. 8vo, pp. xvii + 640; 173 figures, 10 plates.)

THE PREMATURE INFANT.

IN the preface to his work on *Premature and Congenitally Diseased Infants*[2] Dr. JULIUS H. HESS contends that the number of premature births has increased during recent years, and states that of 2,806 deaths of infants occurring in Chicago during one year, 739 in the first month were due to prematurity. The book is divided into four parts: the first is devoted to etiology, physiology, and pathology; the second to nursing and feeding; the third to general diseases; and the fourth to prognosis. The chapter on physiology in Part I contains useful tables of the body weight and other measurements drawn from various authorities as well as by the author. Emphasis is laid on the value of *x*-ray examination for determining the age of the foetus, since osseous development is more regular and offers more factors for consideration than the length and other measurements. A diagram of the skeleton of the full-term infant is given showing the development of the centres in each bone based on roentgenographic studies of 55 cases. In the chapter on pathology, which is based on the work of Ylppö, it is stated that premature birth should be looked on as a traumatic process in which the characteristic lesions are most frequently found in three groups of organs—the skull with the brain and membranes, including the spinal cord, the lungs, and the gastro-intestinal canal. The second part contains chapters on maternal nursing, the selection and hygiene of the wet-nurse, the care and nursing of premature infants, and the methods of feeding. Premature infants are considered in two groups according as they can or cannot be breast-fed. The important rules to be observed in the case of these infants are maintenance of the body-heat from birth, careful individual handling with prevention of infection, and breast milk. Administration of orange juice as an antiscorbutic is commenced at three weeks, and cod-liver oil for its antirachitic properties at four weeks, irrespective of the type of feeding. A special chapter is devoted to incubators, with an account of their history from the time of Denucé in 1857 to the present day, illustrated by numerous photographs of various models. The third part deals with general diseases and the fourth with prognosis. The author considers that the future of premature infants who survive is, on the whole, good. Though they are somewhat more subject to hydrocephalus and to psychic and nervous anomalies, as well as to rickets, anaemia, and tetany, by the time that puberty is reached most of the differences between the premature and the full-term child will have disappeared. Many celebrated men, including Newton, Rousseau, Voltaire, Cuvier, Victor Hugo, Lamartine, and Renan, were born prematurely.

The book, which is well indexed and gives numerous references to current literature, should prove useful.

PUBLIC HEALTH AND ADMINISTRATION.

THE codification of the law relating to public health and sanitation is becoming more urgent year by year and if it were not for the assistance of certain textbooks in dissecting Acts of Parliament, departmental orders, regulations, and the like, the difficulties of officials concerned

[2] *Premature and Congenitally Diseased Infants.* By Julius H. Hess, M.D. London: J. and A. Churchill. 1923. (Med. 8vo, pp. xi + 397; 189 figures. 18s. net.)

with public health administration would be very much increased. One of the best known of these books is the *Handbook of Sanitary Law*, by Dr. B. BURNETT HAM, which was first published in 1899, and the ninth edition[3] of which is edited by Professor H. R. KENWOOD. Under various headings, such as nuisances, water supply, sewerage and drainage, housing, and food supply, the laws relating to the respective subjects are tabulated, and by a free use of cross-references a clear picture is placed before the reader. The first chapter contains a useful list giving definitions of terms used in particular Acts of Parliament, with in many instances (it is a pity it is not in all) the statutory authority for the definition. On page 5 it is stated that the local authority authorized by the Sale of Food and Drugs Act to appoint a public analyst is a county council or a county borough council. To this should be added "a quarter sessions borough having a population of 10,000 and over." Nearly fifty pages are devoted to the law relating to food supplies, in which the editor has brought together various Acts, orders, and regulations, the details relating to milk being very complete. The Sanitary Officers' Order, 1922, which relates to the appointment and duties of medical officers of health and sanitary inspectors, is given almost textually, and there is a very clear abstract of the Local Government and other officers' Superannuation Act, 1922. In a work which so admirably serves the purpose for which it was written it is a pity that greater care was not taken in revising the present edition and the correct titles of Acts of Parliament and other documents given. On pages 11 and 12 the Children Act, the Dairies, Cowsheds and Milkshops Order, the Factory and Workshop Act, and the Housing, Town Planning, etc., Act are all given incorrectly, although the proper designations are to be found on subsequent pages.

Only those who have to administer the law relating to the production and distribution of food can really appreciate the pitfalls which they have to avoid if success is to attend their labours. During a period of nearly forty years *Bell's Sale of Food and Drugs Acts* has been a safe guide for those who would escape them, and the seventh edition,[4] edited by Mr. CHARLES F. LLOYD, of the Inner Temple, has been brought as well up to date as seems possible when dealing with a subject with regard to which the Legislature and the central administering department of the Government appear to have no very settled policy; owing to this lack we have a constant output of Acts of Parliament, amending Acts, postponing Acts, departmental orders, amending orders, and rescinding orders in such quick succession that "order, counter-order, disorder" aptly expresses the present position. Mr. Lloyd has continued the general arrangement of previous editions, and some idea of its completeness may be gathered from the fact that although the principal Food and Drugs Act—that of 1875—contains only 36 sections, it is so fully annotated and there are so many references to legal decisions that more than 100 pages are devoted to this Act alone. As an instance of the extreme care and thoroughness which has been taken in annotating we may refer to Section 16 of the Act, which provides that an article may be sent to an analyst through the post "subject to any regulations which the Postmaster-General may make"; the text of those regulations is given, thus saving much trouble and possible vexation to those concerned with the dispatch of samples. The amending Food and Drugs Acts, the Margarine Acts, and other statutes even remotely bearing on the subject, are considered with care and fullness. The text of the Milk and Dairies (Amendment) Act, 1922, is given in full, and there are many cross-references which cannot fail to be of service. Although the Milk and Dairies (Consolidation) Act, 1915, does not come into force completely until the end of 1925 it has very properly found a place in the appendix, which also contains a very complete set of the circulars and memoranda of the Local Government Board and Ministry of Health with respect to the sale of food and drugs. In this connexion we suggest that it would increase the facility of reference if in future editions the editor would attach to the documents the number given to them by the Ministry of Health. The notes on some of the commoner forms of adulteration which Mr. R. A. Robinson, of the Middle Temple, contributed to previous editions are continued in the present and add to the completeness of the volume.

The student who is preparing for examination in public health will find Dr. AITCHISON ROBERTSON'S *Aids to Public Health*[5] of great use as a refresher. The matter is arranged after the manner of larger well known textbooks, the earlier chapters dealing with meteorology, ventilation, and water supplies, and the later with vital statistics and sanitary administration. The intervening chapters cover the ground very fairly and the information has been brought well up to date. The chapters on drainage and the disposal of sewage are accurately and clearly written, very good descriptions being given of the most modern methods of dealing with sewage. In the section on conservancy systems reference is made to the deodorant power of dry earth, but there is no mention of the nitrifying action of the earth, and it is to this property rather than any power of deodorizing that suitable earth serves a useful purpose when mixed with excreta. On page 150 the zymotic death rate is said to refer to the deaths from notifiable infectious diseases. Many years ago a great deal of importance appeared to be attached to the death rate from the "principal zymotic diseases," but these were not the notifiable infectious diseases, and nowadays the more progressive medical officers of health have no concern with zymotic death rates. We can recommend this little book to those for whom it is primarily intended —public health students.

TYPHOID-PARATYPHOID GROUP OF BACTERIA.

THE many different types of bacilli which, because of their similar behaviour towards ordinary laboratory tests, are arranged together as the typhoid-paratyphoid group, have been made the subject of a special research by Dr. A. HECHT JOHANSEN of the Copenhagen Institute, who has written a monograph[6] in English on their classification. Although for the last ten years a fairly consistent nomenclature has been followed in this country, Continental writers have often been unwilling to distinguish between certain strains which we in this country regard as distinct; this has led to considerable confusion, more particularly in translating from German authors. It is a relief, therefore, to find a familiar classification followed in this book, thus rendering it easy to compare the work of this author with that of our fellow countrymen.

The chief bacteria included in the group are, of course, the typhoid and dysentery bacilli, the paratyphoid bacteria and food-poisoning organisms of the Gaertner type. These resemble each other very closely, and the different classifications which have been proposed in the past, based on the character of growth on media, fermentation reactions, and serological tests, are separately considered by Dr. Johansen and their limitations admitted. The greater part of the original work published in this book describes an attempt at classification based on agglutination and complement fixation reactions in conjunction with absorption tests. About a hundred different strains were studied, and the mass of experimental work recorded indicates that the typhoid, paratyphoid, and enteritidis organisms may be divided into eleven groups. The work would have gained in interest had the same laborious tests been directed towards the paratyphoid C bacillus and the atypical organisms about which there is so much dispute at present, but as it stands it provides a reassuring contribution to

[3] *Handbook of Sanitary Law.* By B. Burnett Ham, M.D., D.P.H. Edited by Henry R. Kenwood, C.M.G., M.B., F.R.S.Edin., D.P.H. Ninth edition. London: H. K. Lewis and Co., Ltd. 1923. (Fcap. 8vo, pp. xxviii + 244. 5s. net.)

[4] *The Sale of Food and Drugs Acts.* By the late Sir William J. Bell, LL.D. Edited by Charles F. Lloyd. Seventh edition. London: Butterworth and Co., and Shaw and Sons, Ltd. 1923. (Crown 8vo, pp. xxv+426. 15s. net.)

[5] *Aids to Public Health.* By W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P.E. London: Baillière, Tindall, and Cox. 1923. (Fcap. 8vo, pp. viii + 160. 3s. 6d. net.)

[6] *Classification of the Strains belonging to the Typhoid-Paratyphoid Group of Bacteria.* By A. H. Johansen. Copenhagen: Levin and Munksgaard. 1923. (Sup. roy. 8vo, pp. 206.)

the classification of these important but still ill defined groups of bacteria. The exhaustive tests advocated in this monograph are very time-consuming, and inspire once more the hope that some simpler method of study will one day be discovered.

The second part of the book describes experiments on the avidity of antiserum for complement. These were complicated researches which certainly throw light on the laws governing the fixation between antigen and antibody, but they do not add anything to our knowledge of individual members of the group, nor of the relationship of one organism to another. It is to be regretted that the manuscript was not better translated, for in many places the language is decidedly ambiguous.

THE HOME AND HEALTH IN INDIA.

THE fruits of long experience and competent observation are garnered in Dr. KATE PLATT'S book[7] on *The Home and Health in India and the Tropical Colonies*. It is a manual of advice which will be particularly valuable to women going to these regions for the first time. The chapter on outfit and equipment is of first importance and should of course be studied before leaving this country. In choosing a home newcomers are inclined to be influenced by the beauty of a bungalow near a tank or surrounded by luxurious vegetation, and they may learn by sad experience that the pleasures of the scenery are more than counterbalanced by the abundance of mosquitos. The fly nuisance is well dealt with by Dr. Platt, and the dangers of disease conveyance and methods of protection are explained. As regards domestic sanitation, however, she seems to have a leaning to conservancy methods rather than house drainage, on the ground that lack of intelligence on the part of native servants may make the latter a failure. But the newcomer would do well to remember the possibility of a sweepers' strike, which is a very serious matter for those who have not the benefit of a water carriage system.

A large part of the book is devoted to the health of the mother and child in India, and will be appreciated by the young wife. For those in outlying districts where medical attendance is not easily or immediately available, the chapters on tropical diseases, skin troubles, bites, and stings, will be of great service both in emergencies and for general guidance. Dr. Platt has been very happy in her clear and simple explanation of technicalities. She and her readers are alike to be congratulated on her success, and the book ought to find a place in the equipment of every young wife about to settle in India or the tropics.

NOTES ON BOOKS.

THE second edition of Dr. FRIEL'S monograph entitled *Electric Ionization*[8]—the first was published in 1920—has appeared. In addition to a general overhauling and revision which has resulted in a considerable enlargement of the parts devoted to the statement of electrical facts and to the explanation of electrical terms, additional chapters are given dealing with ionization as applied to the treatment of certain diseased conditions; for instance, there is a special chapter on pyorrhoea, another on endometritis, and so on. The work now contains so much more material and information as regards the actual application of ionization that its value as a textbook has been considerably enhanced, and those interested in this somewhat specialized branch of therapy will find much that is of value from the practical point of view. It is well presented and well printed; the illustrations are good and useful, and the index is sufficient.

The Dominant Sex: A Study in the Sociology of Sex Differentiation,[9] has been admirably translated by EDEN and CEDAR PAUL from the German work of Mathilde and Mathias Vaerting. Their investigations have led them to the conclusion that the relationships of the sexes as regards dominance vary in a manner somewhat resembling the swing of a pendulum; in some instances, as in ancient Egypt, Sparta, and the Iroquois, women have had the upper hand; but in almost all parts of the civilized world society is now in the phase of transition from the nearly universal dominance of man to the equality of the sexes. The authors believe that there is always a deliberate or an unconscious campaign to modify the records of the past so as to establish the tradition that the sex in power has always been the dominant one; they consider that this bias is strong, and that many eminent writers, including Max Müller, show it. A special chapter is devoted to the campaign against the historical vestiges of the dominance of women. The dominance of one sex is, they hold, much more important than inborn physiological factors in determining differences in physique, division of labour, and habits such as dress.

The eighth edition of the book on treatment in the Berlin university clinics,[10] edited by Dr. W. CRONER, consists of twelve sections in which the whole of medicine, surgery, obstetrics, and gynaecology is dealt with by specialists in each branch. There is an appendix consisting of four sections devoted respectively to intoxications, dietetic cures, principles of vaccine and serum therapy, and the chief organic extracts, of which the last two have been added since the seventh edition appeared. The diseases in each section are arranged in alphabetical order.

Insurance law is usually classified under the headings marine, fire, or life insurance, but Mr. WELFORD, who is already jointly responsible for a book on fire insurance, has now produced a book on *The Law Relating to Accident Insurance*,[11] and, despite inevitable overlapping, his treatment of the subject justifies his ambitious project. There is scarcely a claim or proposal form relating to insurance for personal injuries which does not require either a medical certificate or report or even in some cases a *post-mortem* examination; with this part of the law Mr. Welford deals fully. A recent case of interest to the medical profession is quoted; a policy provided that no indemnity was to be payable unless the assured had been regularly under the care of a legally qualified medical practitioner; the assured, who had fractured his foot, placed himself under the care of a bonesetter; it was held that there was a breach of condition and that the assured could not recover.

[7] *The Home and Health in India and the Tropical Colonies.* By Kate Platt, M.D., B.S.Lond. London: Baillière, Tindall and Cox. 1923. (Cr. 8vo, pp. 216. 5s. net.)

[8] *Electric Ionization: A Practical Introduction to its Use in Medicine and Surgery.* By A. R. Friel, M.A., M.D.Dub., F.R.C.S.I. Second edition. Bristol: John Wright and Son, Ltd.; London: Simpkin, Marshall, Hamilton, Kent, and Co., Ltd. 1922. (Demy 8vo, pp. 132; 43 figures. 8s. net.)

[9] *The Dominant Sex: A Study in the Sociology of Sex Differentiation.* By Mathilde and Mathias Vaerting. Translated from the German by Eden and Cedar Paul. London: George Allen and Unwin, Ltd. 1923. Demy 8vo, pp. 240. 10s. 6d. net.)

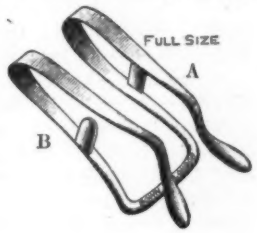
[10] *Die Therapie an der Berliner Universitäts-Kliniken.* Edited by Dr. Wilhelm Croner. Achte auflage. Berlin and Vienna: Urban and Schwarzenberg. 1923. (Cr. 8vo, pp. vi + 698.)

[11] *The Law Relating to Accident Insurance.* By A. W. Baker Welford, of Lincoln's Inn, Barrister-at-Law. London: Butterworth and Co. 1923. (Roy. 8vo, pp. civ + 651 + 54. 35s. net.)

MEDICAL AND SURGICAL APPLIANCES.

Nasal Dilator for Use during Anaesthesia.

DR. A. L. FLEMMING (Senior Honorary Anaesthetist, Bristol Royal Infirmary) writes: The dilator illustrated herewith is retained in position by the shoulders, A engaging in the vestibula, and the lugs B prevent the alae nasi from contracting. The value of the dilator is well illustrated in the administration of nasal gas, in which case it greatly diminishes the tendency for nasal to be replaced by oral breathing during induction. The makers are Messrs. Down Bros., Ltd., 21-23, St. Thomas's Street, London, S.E.1.



Diathermy Knife.

MR. WALTER G. HOWARTH, F.R.C.S.Eng. (London), has found the instrument here described useful in the excision of malignant growths of the pharynx, tongue, tonsil, and palate with the diathermic spark. It consists of a platinum knife embedded in a thin glass tube covered for the purpose of further insulation by thick rubber tubing. The cable is very light. The instrument has

been in use for several years at St. Thomas's Hospital, and several have been made by Mr. Winch of the *X*-Ray Department. The advantages over the usual soft metal knife are that a more intense and less diffuse spark is obtained. This is particularly useful when it is desired to use the spark as a cutting instrument in the complete excision of growths. The instrument can now be obtained from Messrs. Mayer and Phelps, New Cavendish Street.

THE TREATMENT OF GENERAL PARALYSIS BY TRYPARSAMID:

PENETRATION OF THE DRUG INTO THE CEREBRO-SPINAL FLUID.

THERE are many points of similarity in the pathology of sleeping sickness and of general paralysis. In both diseases there is an invasion of the brain by a specific organism, and it is therefore probable that a therapy that would arrest or cure the one disease would arrest or cure the other.

It is certain that cerebro-spinal syphilis occurring within the first few years after infection has yielded to treatment by mercury or arsenobenzol compounds, and, provided the treatment had been adopted before thrombosis of vessels and degenerative softening of the neuronic structures had occurred, surprisingly satisfactory results were obtained. Whereas in general paralysis, although arrests and even cures were announced as a result of intensive treatment by arsenobenzol compounds or their substitutes, either by intravenous injections of the drug or by intrathecal injections of salvarsanized serum, further experience only showed that a successful remedial treatment had yet to be found.

The question arises whether this difference in the results of treatment of these two forms of neural syphilis is due to a resistance of the organism, owing to a morphological latent form in the nature of a granule in general paralysis, or whether there is a specific organism which has acquired some means of resistance to these metallic poisons. For general paralysis, it is said, is unknown among races of people who have not been subjected to treatment. Experiments by Förster and Tomaschewski showed that apes could not be inoculated by brain tissue containing living spirochaetes, and Levaditi and others have brought forward many facts and arguments tending to establish the existence of two forms of spirochaetes—a neurotropic and a dermatotropic. It has been shown that a considerable percentage of infected people give a positive Wassermann reaction of the cerebro-spinal fluid and that in spite of effective treatment a certain proportion remain positive. It is probable some of these are the cases that eventually develop the late forms of neural syphilis.

How can this be explained? The blood and general lymphatic circulations may have received abundance of the spirillicidal agent, yet the positive reaction of the fluid indicates the existence of the organism in the tissue of the central nervous system. An explanation may be found in the fact that the organism has left the general lymphatic circulation which accompanies the vessels of the brain and entered the closed circulation of the cerebro-spinal fluid which irrigates the brain. Histological examination, in fact, shows that the spirochaetes lie in little foci actually in the nervous tissue. Their multiplication produces a toxin which escapes with the cerebro-spinal fluid along the perivascular spaces, thence into the subarachnoid space, setting up a meningo-encephalitis there. In sleeping sickness a similar meningo-encephalitis is set up by the toxins produced by the trypanosomes in the nervous tissue.

There is probably an anatomical reason why cerebro-spinal syphilis yields to treatment. It is that the specific organism which is causing the meningitis, perivascularitis, and endarteritis is located in the lymphatics which form a part of the general lymphatic circulation. The spirochaete is therefore accessible to the therapeutic agent. That that is so seems probable from the fact that in general paralysis and sleeping sickness inflammation of the endarterium does not occur. The inflammatory reaction in these diseases is in the perivascular sheath of veins and arteries, and not in the tunica adventitia. The cerebro-spinal fluid is a secretion of the choroid plexus, and there is evidence that the usual spirillicidal drugs either pass with great difficulty or do not pass at all through the choroid plexus. Such drugs as soamin and atoxyl, which were once used for the treatment of sleeping sickness and found ineffective, probably did not penetrate the cerebro-spinal fluid in the doses it was safe to administer. Likewise, as already remarked, experience showed that salvarsan and its substitutes were inefficient in the treatment of general paralysis. Indeed, the progress of the disease often appeared to be hastened by energetic treatment with this drug.

In the *Journal of the American Medical Association* (May 26th) the remarkable results of the therapeutic use of tryparsamid in neuro-syphilis are recorded by W. F. Lowry, A. S. Lowenhart, W. J. Blackman, and E. J. Hodge. The tryparsamid used in their work at Madison, Wisconsin, was supplied by the Rockefeller Institute. They state that "it is our clinical experience, largely borne out by histologic studies, that the demarcation between meningo-vascular syphilis and paresis is not very clear. Excepting the extremes of these conditions, the transitional point, or mean, is a matter of opinion." It is for this reason that I have set out above what I conceive to be the essential pathological difference.

The very successful results obtained by these investigators may be interpreted in two ways. First, it may be said that among their cases are included early forms of neuro-syphilis that were readily curable by mercurial inunction in the pre-salvarsan days and still more readily curable by modern intensive treatment. It might be argued also that some cases of general paralysis undergo spontaneous remission. However, this certainly does not account for the fact that "of the total of fifty-four cases of paresis studied, twenty-eight have been discharged from the hospitals and have been holding positions and earning a livelihood for themselves and their families for periods ranging from six months to two years."

The Wisconsin workers relied at first solely upon tryparsamid, but they found "that the additional use of mercury during the time of tryparsamid treatment resulted in more permanent improvement of the serologic findings as well as more rapid clinical improvements." Incidentally it may be asked whether this is not the same experience as with salvarsan. The treatment now adopted by them is as follows:

> "To dissolve 3 grams of tryparsamid in 10 c.cm. of sterile freshly distilled water and to inject the total amount intravenously. This solution is given at intervals of one week and for a period of eight weeks. At the same time mercuric salicylate is administered intramuscularly in 1-grain doses. The mercury is given three days before the tryparsamid, and a total of nine such injections, alternated with the eight injections of tryparsamid, comprise a course. A rest is then given of from five to eight weeks, when a second course is repeated. After this second course and a period of rest, if there is continued evidence of activity or the case is still serologically positive, a third course is given.

A note of warning is sounded as to the danger of retinal affection, but other complications arising from arsenic are not mentioned. It would be interesting to know whether neuritis, dermatitis, and liver affections do not occur.

It has already been pointed out that there is an essential difference in the pathological conditions which would account for the one form of neural syphilis yielding readily to treatment, whereas the other (for the same reason as sleeping sickness) does not yield to treatment. I cannot agree with the following statement: "It is our clinical experience, largely borne out by histologic studies, that the demarcation between meningo-vascular syphilis and paresis is not very clear." Before hailing this new drug, combined with mercury, as a cure for general paralysis it will be necessary to have the results of independent observers who will not include all cases of meningo-vascular syphilis with mental symptoms in the group of general paralysis. In the summary, the claims of success are more restricted. "Clinical and serological improvement in early and violent cases of paresis is extremely striking. The recovery or improvement is not absolutely stable; but the use of mercuric salicylate with the tryparsamid tends to stabilize the improvement." The main question is this: Can tryparsamid intravenously injected penetrate the cerebro-spinal fluid and the tissues of the brain and by its direct or indirect influence kill or arrest the development of the trypanosome or spirochaete without injuring the nervous tissue?

In an article published in the *Journal of the American Medical Association* on June 2nd, entitled "Tryparsamid and its penetration into the spinal fluid," it is stated that "workers of the United States Public Health Service have now made available the results of an experimental investigation of the penetration into the cerebro-spinal fluid of tryparsamid and other arsenicals which is enlightening as to the mechanism by which the reported effects (previously

alluded to in general paralysis) are brought about." A heavy suspension of *Trypanosoma equiperdum* was injected into the cranial subarachnoid space of rabbits.

"No essential difference in behaviour towards arsenicals has been discovered between *T. equiperdum*, *T. gambiense* and *Spirochæta pallida*. Preliminary investigation demonstrated that trypanosomes thus injected would be recovered in considerable numbers. Tryparsamid and other arsenicals were then injected into the ear vein of infected animals. After twenty-four hours a careful search was made in at least six different specimens of cerebro-spinal fluid taken from the various subarachnoid spaces of the brain and medulla. The absence of trypanosomes in these specimens was considered evidence of permeability of the membranes by the arsenical injection or by some trypanocidal derivative. Under these experimental conditions tryparsamid proved more effective than any other arsenical used. An amount which was only 4 per cent. of the minimal lethal dose was 87 per cent. efficient. Sulpharsphenamin with 16 per cent. of its minimal lethal dose was 82 per cent. efficient."

These experiments show that this arsenical preparation, probably by its penetration into the fluid, acts more efficiently than other arsenical preparations in destroying trypanosomes. We are told that the drug is "a white crystalline solid extremely soluble in water. It is odourless, tasteless, and possesses practically no local irritating action."

Should further observations on an extensive scale show that a safe remedy for the arrest or cure of general paralysis and sleeping sickness has been found, it will be a great triumph for experimental medicine.

FREDERICK W. MOTT.

A NOTE ON THE "SO-CALLED PARKINSON'S MASK."

THE peculiar after-effects or residua of epidemic encephalitis have given rise to an increasing study of everything appertaining to paralysis agitans. The name of Parkinson has thus become familiar to many who, a few years ago, might have hesitated before stating the exact disease with which it is associated. By utilizing the recognized synonym of paralysis agitans—namely, "Parkinson's disease"—we obtain a short and easy series of substantives and adjectives wherewith to describe the various signs and symptoms following epidemic encephalitis.

On the continent of Europe, where these residua have been even more common than in this country, this terminology has been adopted extensively. "The Parkinsonian syndrome," "Parkinsonismus," "pseudo-Parkinsonism," and other modifications, are at the present time in use in medical papers. Their exact meaning differs somewhat with different writers. Some use the term for conditions other than pre-senile or true paralysis agitans; others retain the expression "Parkinsonian" for the disease which Parkinson described, and use the term "pseudo-Parkinsonian" for other similar but distinct conditions. There is thus a certain amount of confusion in the use of the terms.

In any case the adoption of this nomenclature has called attention to Parkinson's original *Essay on Shaking Palsy*, published in 1817, and all who have read it must admit that his clear and accurate description of the disease, as he saw it, deserves this tribute to his memory.

James Parkinson was a surgeon who practised in Hoxton; he wrote a number of small medical books in addition to his essay. He got into trouble in 1794 in connexion with the "popgun plot" to assassinate George III in the theatre by means of a poison dart, as is described more at length in the *Dictionary of National Biography*. He was also a palaeontologist and wrote a big book in three volumes (1804-1811) entitled *Organic Remains of a Former World*, described as "the first attempt to give a familiar and scientific account . . . of fossils." He was an original member of the Geological Society. He died on December 21st, 1824.

Thanks to the enterprise of the *Archives of Neurology and Psychiatry* (1922, vii, 681), this essay has now been reprinted and is available for anyone to read. On reading it again recently, I was surprised to find that it contains no allusion to the facial expression in paralysis agitans. There is an excellent description of the tremor, and its temporary cessation on voluntary movement; the stooping attitude; the hurried gait; the salivation. There are also statements which appear to refer to postural changes and rigidity, together with remarks on the supposed pathology and suggestions for treatment; but from first to last, there is no reference to the "facies."

This is the more surprising because, prior to the use of the term "Parkinsonian" in connexion with the residua of epidemic encephalitis, the only sign of paralysis agitans to which the author's name was commonly attached was the characteristic "facies"—the so-called "Parkinson's mask." It is, indeed, the irony of fate that, more than a century after his death, Parkinson's name should be particularly attached to practically the only prominent sign which he failed to record in his essay. It seemed to be a matter of some historical interest to find out when and where this term "Parkinson's mask" arose. With the assistance of the librarian at the Royal Society of Medicine (Mr. H. E. Powell) an attempt has been made, and the following facts ascertained:

First Recognition of Symptoms.

So far as we can ascertain, Charcot, in his many writings, in the middle of last century, was the first to emphasize the diagnostic importance of the immobile "facies" in paralysis agitans. We cannot find that any of the leading textbooks prior to this period make any reference to it. Whether or not Charcot himself first observed it seems uncertain. Fagge in the first edition of his *Textbook of Medicine* (1886, i, 629) writes: "According to Charcot the features present a peculiar immobility and want of expression"; but Charcot and Vulpian *(Gaz. Hebdomadaire de Médecine et de Chirurgie*, 1861-62, vols. 8 and 9) quote a case described by Oppolzer in the *Wiener medizinische Wochenschrift* for 1861, where he says "der Gesichtsausdruck ist ganz apathisch!". This may possibly have drawn Charcot's attention to the sign.

It is thus probable that the pathognomonic facies of paralysis agitans was not recognized—at any rate, it was not recorded—until about fifty years after Parkinson's original essay was published. This is as surprising as that a shrewd observer like Parkinson should have omitted all mention of it. Is it possible that this particular feature of the syndrome was absent or less marked during the first half of the nineteenth century?

Such a suggestion might have seemed rather far-fetched a few years ago; but our experience of the effects of epidemic encephalitis shows that the different components of the syndrome which we call "post-encephalitic paralysis agitans" may each occur separately and almost alone, and that the particular region involved may be strikingly limited. Thus it is not uncommon to find the residuum following encephalitis in the form of the characteristic "facies" of paralysis agitans as the earliest and most striking feature; the extent to which the rest of the body is then affected may be exceedingly slight.

Even in pre-senile paralysis agitans the facies may be absent for long periods. Moreover, diseases do change their type from time to time. This may possibly explain the curious oversight of this striking sign, not only by Parkinson who studied, carefully, some cases, but by physicians during the following half-century, who at least wrote about them.

Origin of the Term "Mask."

The earliest record that I can find of the use of this term to describe a facial expression is in a paper by Gayet, in the *Archives de Physiologie* (1875, ii, Série II, 341). He there records what he calls an "affection encéphalique" which bears a striking resemblance to epidemic encephalitis. In this article the term "masque" is repeatedly used. Thus he writes: "Tout le masque est singulièrement affaissé." "Il n'a plus son masque facial si prononcé." "Le masque de la face s'est amélioré." It is interesting that this early use of the term should be in connexion with a case, not of paralysis agitans, but of an acute disease simulating epidemic encephalitis in many respects. The first evidence that we find of its application to the facies of paralysis agitans is in the article on this disease by W. Sinkler in Pepper's *System of Medicine*, vol. 5 (1886). Two

years later Paul Richer *(Nouv. Icon. de la Salpêtrière*, 1888, p. 213) writes of the facial expression in paralysis agitans, "C'est masque vide, dont la vie semble absente."

The term "facial mask," or mask-like face, applied to paralysis agitans, thus seems not to have been used at all generally until after Charcot's time. It has the advantage of being brief, though not an apt description of the condition.

The Earliest Use of the Term "Parkinson's Mask."

So far as our investigations go, the first use, in print, of the term "Parkinson's mask" is found in the first edition of Osler's well known *Textbook of Medicine*, 1892. Mr. Powell has searched through all the leading textbooks from 1817 to 1892 and can find no previous use of Parkinson's name in this connexion.

The actual expression which Osler uses is rather curious, "the so-called Parkinson's mask." This was repeated in each succeeding edition down to 1916. To one as familiar with the original works of the past as Osler was the fact that Parkinson had not described the facies of paralysis agitans must have been well known; hence the form of his expression—"the so-called Parkinson's mask." It seems, therefore, probable that about the early nineties the term "Parkinson's mask" had become current amongst certain medical teachers in certain parts of the world, and that Osler first gave it official recognition as a concise* and convenient label for the student.

It may be said that in using the term "Parkinson's mask," we merely mean the mask-like face seen in Parkinson's disease, and as such the term is quite warranted. When, however, the term "Parkinsonism" is applied, as it frequently is at the present time, to post-encephalitic residua which may consist of nothing but an immobile face with certain mental and moral changes in character, it is historically inaccurate.

In conclusion, I desire to thank Mr. Powell for his valued help, and to take this opportunity of pointing out to my colleagues living in the provinces the many valuable services which the Royal Society of Medicine places so generously at the disposal of those Fellows who are unable to make frequent personal visits to the library.

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EPSOM COLLEGE.

THE annual general meeting of the governors of Epsom College was held at the office, 49, Bedford Square, W.C., on June 29th, when the treasurer, Sir HENRY MORRIS, was in the chair.

The names of the successful candidates for foundation scholarships were announced as follows: Thomas M. Newton, Jeffrey O. Timms, James D. Johnston, Irwin J. McGhie, Denis A. Sanford, H. Vincent Adcock. The successful candidate for the ordinary pensionership was Adelaide Lynch.

In submitting the annual report of the Council, the chairman drew attention to the loss the College had sustained by the death of Mr. Clement Locke Smiles, as well as by the retirement from the Council of Mr. Walter Archibald Propert, the grandson of the Founder of the College. The governors were also informed that Mr. W. Douglas Crossley, who entered the College as a master in September, 1888, and was appointed bursar in September, 1890, was about to retire, after a service to the College of practically thirty-five years. The chairman paid a tribute to the zealous and efficient way in which Mr. Crossley had carried out the duties of his office during that long period. The chairman further reported that Mr. Bluett, one of the honorary auditors, had died since the last annual general meeting, and that the Council proposed that Mr. Norman C. King, the registrar of the General Medical Council, should be appointed an honorary auditor in his place. The chairman also drew attention to two pension funds recently instituted, and mentioned that the Council had decided to propose that, in consequence of the increased cost of living, amendments in the by-laws should be made to permit a somewhat larger income than hitherto held by persons wishing to become candidates for various pensionerships—namely, £100 a year instead of £60. He stated that steps had been taken to begin at once the work of rebuilding the nave of the chapel in harmony with the new chancel, in spite of the fact that the funds in hand were not sufficient for the purpose, and he urged all friends of the College to do their best to secure contributions.

In the report to the governors, the Council expressed its thanks to the various honorary local secretaries, the British Medical Association, and other friends who had assisted the Royal Medical Foundation attached to the College by obtaining donations and subscriptions, as well as to the editors of the *British Medical Journal* and *Lancet* for many services kindly rendered. The Medical Insurance Agency of the British Medical Association had again sent generous contributions, for which the Council was grateful. For many years it had been customary to elect as vice-presidents those who had collected the sum of £1,000, and as the Rev. Walter J. Barton, the late head master, had succeeded in completing this sum, the Council proposed that he should be elected a vice-president of the College.

After the adoption of the annual report and accounts, formal business was transacted, including the re-election of members of the Council and auditors, and the adoption of new by-laws. A cordial vote of thanks to the chairman was proposed by Dr. Raymond Crawfurd, who drew attention to the valuable services rendered to the College by Sir Henry Morris as treasurer. This resolution was seconded by Mr. Hollis Walker, K.C., and carried with acclamation.

BIRTHDAY HONOURS.

THE deferred list of honours granted on the occasion of the King's birthday was issued as a supplement to the *London Gazette* of June 29th. The following are among the names of those upon whom honours have been conferred:

Baronetcy.

Major-General Sir Anthony A. Bowlby, K.C.B., K.C.M.G., K.C.V.O., F.R.C.S., President of the Royal College of Surgeons of England; Consulting Surgeon to St. Bartholomew's Hospital.

Knighthoods.

George Francis Blacker, C.B.E., M.D., F.R.C.P., F.R.C.S., Dean of University College Hospital Medical School.

Ewen J. Maclean, M.D., F.R.C.P., F.R.C.S. For services to the Ministry of Health in Wales. Dr. Maclean was formerly chairman of the Representative Body of the British Medical Association, and presided over the Annual Representative Meeting in 1911 and 1912, when held in Birmingham and Liverpool respectively.

C.B.E. (Civil Division).

Lieut.-Colonel John Southey Bostock, M.B., Ch.B., Director of Medical Services, Ministry of Pensions.

The distinction of C.B.E. (Civil Division) is also conferred upon Mr. Ernest T. Nethercoat, President of the Pharmaceutical Society, in recognition of his services in connexion with the Dangerous Drugs Regulations.

THE second International Congress of Comparative Pathology will be held in Rome from October 7th to 14th. The subscription is 40 lire. Further information can be obtained from Professor Perronetto, 40, Corso Valentino, Turin.

THE thirty-eighth annual meeting of the Caledonian Medical Society was held on June 29th in the rooms of the Aberdeen Medico-Chirurgical Society. The President, Dr. D. Rorie, D.S.O., took as the subject of his presidential address the career of Dr. George Boswell, who was surgeon to King James VI of Scotland. The meeting was largely attended, and at the dinner the same evening seventy members and guests were present. It was arranged to hold the next annual meeting of the society in Liverpool under the presidency of Dr. David Smart.

* In Fagge and Pye-Smith's *Textbook of Medicine* (fourth edition, I, 877) the words are, "The features are immobile and the face has a remarkable impassive expression, like a mask, as Parkinson described it." The name Parkinson is evidently a "lapsus calami" for Charcot, which occurs in previous editions.

British Medical Journal.

SATURDAY, JULY 7TH, 1923.

CANCER: ITS CAUSES AND TREATMENT BY RADIUM.

Of all the hypotheses which have been advanced from time to time to explain the causation of cancer, only one receives any measure of support from the experimental studies of recent years—namely, the original theory of Virchow that tumours are caused by irritation, chemical or physical. This seemed the most likely interpretation of the facts observed by those who studied the clinical manifestations in the days before methods of inducing cancer in animals had been discovered; it has been sustained by the evidence derived from the experimental production of cancer following such irritants as tar, paraffin, and *x* rays. In a British Medical Association Lecture published this week (p. 1) Dr. Archibald Leitch discusses several different agents which have been shown to be capable of producing cancer in animals; all are of an irritating nature, being foreign to the cells of the body, and invoking in them the familiar response—proliferation and increased cellular activity.

Evidence derived from experimental inquiry into the causes of cancer has not only brought support to the doctrine that cancer follows chronic irritation, but has also very considerably narrowed the issues by demonstrating that certain irritants are very potent agents in producing tumours, whereas others have not been found to possess carcinogenic properties, to use the term the lecturer has devised. The irritant is therefore in a sense specific; it evokes a response in the cells which is at first similar to that aroused by other stimuli, but later, on account of its peculiar nature, leads to the anarchic and progressive proliferation that we call cancer. The evidence is that certain irritants easily produce cancer, while others do not.

A second fact which the experimental study of cancer has brought to light is that the specific irritant produces cancer only in certain animals, and only in the susceptible tissues of these animals. Thus only particular races of rats can be infected with spiroptera carcinoma, and, in those which are susceptible, tumours develop most rapidly in the stomach and tongue, but are unknown in the oesophagus; cysticercus sarcoma does not affect mice, and even certain strains of rats are refractory to this tumour-producing agent. Dr. Leitch has failed to produce tar cancer in rats or guinea-pigs by the employment of a method which readily succeeded in mice. He had succeeded in producing cancer in mice by applications of paraffin, but failed in similar experiments on rats, guinea-pigs, and rabbits. Again, cancer following exposure to *x* rays was unhappily a very common affliction of early radiologists, but no one has yet succeeded in producing epithelioma in animals by the application of *x* rays. It seems, therefore, that there must be not only a specific type of irritant, but also a peculiar cellular susceptibility in order that cancer should follow irritation.

Another important fact made clear by the experimental studies Dr. Leitch passed in review is that a considerable space of time may elapse between the action of the irritant and the appearance of the neoplasm. A careful study of human cancer has often failed to reveal any recent antecedent irritation, but sufficient consideration has not been given to the possibility that a bias towards malignancy may be imparted to cells by some previous, and even distantly previous, irritation. That this may be the case is shown by Dr. Leitch's experiments with tar cancer, for he has observed that even if he stopped the applications of tar before there was any sign whatever of neoplasia, "in due course warts appeared and the phenomena of malignancy were unfolded just as before." The possibility that a particular tumour has followed the action of an irritating agent cannot be dismissed because the irritant has not been detected immediately prior to the appearance of the growth, for it may have been present in the past, and, though absent for some time, have transmitted to the neighbouring cells the fatal tendency to malignant proliferation.

Experiment has shown that cancer is not essentially a disease of ageing tissue; the reason why this disease more frequently occurs with advancing years is capable of another explanation than that the cells are manifesting senile changes. Dr. Leitch made two parallel series of experiments, using in one set adult mice and in the other mice all under six weeks old, and found that, after the application of tar, neither in yield of tumours nor in rate of tumour growth was there any appreciable difference between the two. The essential point may be the length of time the causal agent is in operation. Since in most instances this requires a protracted period, it becomes obvious why cancer is usually a disease of middle or old age.

To the pathologist it is of great interest to notice that after the application of paraffin to mice in some cases carcinoma and in other cases sarcoma developed in approximately the same time. Thus two very different kinds of tumour can be produced by the same agent, according to whether the irritant substance affects chiefly the epithelial or connective tissue cells. It is not claimed that the irritant is necessarily the actual cause of the cancer; as Dr. Leitch observes, the carcinogenic agents may only be "the mediate and not the proximate causal factors of the disease." All that is claimed for these tumour-producing agents is that they bring about a pathological state of the tissues, and that on this prepared soil the undetermined causal agent of cancer can then exert its action. Still, it is curious that both carcinoma and sarcoma should follow the application of paraffin after approximately the same interval of time.

The fact that after a tar epithelioma has been extirpated from a mouse subsequent applications of tar do not induce any further tumour is an observation which may prove to be of great practical importance. After the removal of a spontaneous tumour from a mouse Dr. Murray found that the animal did not show any neoplastic response when afterwards subjected to painting with tar. This suggests that the occurrence of one form of cancer in an individual "protects the body in some way against the occurrence of another." Dr. Leitch warns us against hasty conclusions from these experiments, and the result of further researches along these lines will be awaited with great interest, for they seem to hold out a promise of the justification of the optimistic spirit in which Dr. Leitch concludes his masterly review of the experimental inquiry into the causes of cancer.

His lecture is wholly concerned with the etiology of cancer, unless it can be said that Dr. Murray's

observation quoted above gives support to the surgical doctrine of early and complete removal. But cure is only less important than causation, and here it is satisfactory to note some hopeful signs. The treatment of cancer by radium, for example, is based on theoretical principles which encourage a hopeful attitude. As has been pointed out in the last two annual reports of the Radium Institute, the effect of radium irradiation upon any living cell, if of sufficient intensity and permitted to act for a sufficient length of time, shows three phases. First, there is an increase of cell activity, accompanied, it may be, by proliferation; secondly, there is an arrest of cell activity; and finally, degeneration and destruction of the cell. These three phases merge into each other, and no hard and fast line can be drawn between them, for the transition from stimulation to destructive irradiation is simply one of degree, depending entirely upon the intensity of the stimulus. It has been established that all cells are more vulnerable to irradiation when in a state of active nuclear division, and a pathological cell is much more susceptible than a normal to irradiation, so that a stimulus which would act only beneficently on a normal cell may prove destructive to an abnormal one. Successful radium therapy is dependent on the correct appreciation of these facts. Thus, if the dose be incorrectly calculated, and be excessive, destruction not only of the pathological but also of the normal cells occurs, resulting in great loss of tissue, with the formation probably of an intractable ulcer or fistula. On the other hand, if the dose be too weak, the pathological cells may be stimulated to activity, with consequent rapid increase in the size of the growth.

The paper by Drs. Donaldson and Canti on fifty cases of carcinoma of the cervix treated with radium (p. 12) affords an illustration of the care which must be taken in estimating the dose of radium rays necessary and in its application. In both respects they make valuable contributions to knowledge. They have sought by experiment to ascertain the proper dose, and incidentally have arrived at the conclusion that with the quantity of radium employed by them a continuous irradiation for twenty-four hours is much more effective than an application for eight hours thrice repeated. No extravagant claims to curing cancer are made by these authors, but they demonstrate once more that patients undoubtedly derive benefit from this form of treatment, in that the distressing symptoms of haemorrhage and vaginal discharge often disappear, and ulceration may be diminished. They point out also that in operable cases a preliminary application of radium causes the disappearance of fungating growths or ulcers, "so that the risk of infection and of implanting new growth from the cervix at the time of incising the vagina is markedly diminished." The amelioration of symptoms which follows radium treatment was shown to be accompanied by definite histological changes; all the cells in close proximity were killed, whereas on those in the zone beyond this the irradiations did not seem to have an immediate lethal effect; about the third day, however, the chromatin of the cells was breaking up into droplets; on the third and fourth days a large number of cells still further away showed marked activity. A series of definite changes occurred in the carcinoma cells, leading eventually to their complete destruction, whereas the normal cells were less vulnerable, and in the uterine musculature local atrophy and fibrosis only took place at a later date. The treatment of cancer by irradiation is still in its infancy; general principles have yet to be firmly established, an effective technique evolved, and correct dosage determined by experiment.

The two papers published in the JOURNAL this week illustrate how the problem of cancer is being studied from widely different points of view. The patient and exhaustive inquiry into the etiology of cancer has defined certain types of carcinogenic agents and showed that they only act on certain types of cell; slow but definite progress is made towards the ultimate goal of the cure of cancer by the cautious experiments carried out with irradiation.

The public is waiting for a startling discovery of the cause of cancer or some dramatic invention for its cure. This may, of course, be achieved in the future, but in the meantime it is reassuring to realize that if the problem of cancer is viewed in its natural perspective, and its dimensions, positions, and relations thoughtfully considered, it becomes obvious that the tide of knowledge is rising steadily and irresistibly.

> For while the tired waves, vainly breaking,
> Seem here no painful inch to gain,
> Far back, through creeks and inlets making,
> Comes silent, flooding in, the main.

THE NEW HOUSE OF THE BRITISH MEDICAL ASSOCIATION.

THE British Medical Association has acquired a fine building in Bloomsbury for its future headquarters. If a change was to be made—and undoubtedly a change had become necessary—members of the Association will, we believe, be practically unanimous in agreeing that the choice of locality has been happy. Bloomsbury has been slowly undergoing a transformation from an area of somewhat dingy respectability into the academic quarter of London. The change began when the British Museum was built towards the southern part of the district and University College a little beyond its northern border. The British Museum has been enlarged northward to almost twice its former dimensions; University College has extended mightily to the south and east. Some eleven acres of the central part have been bought by the Government for the headquarters of the University of London and perhaps for King's College. A site has been found and cleared for the Imperial School of Hygiene at the western side of the district, and the British Medical Association is now to establish itself on its eastern edge.

The building which the British Medical Association will in future occupy is of singularly gracious proportions, and, while thoroughly individual, recalls memories of Kensington Palace and Hampton Court, and so of the genius of Sir Christopher Wren, who has found a successor in Sir Edwin Lutyens, the architect of our new building. The whole design has not been completed, but arrangements are being entered into which will enable the Association in due time to carry out any extension which may be considered necessary. The building is approached from what is becoming one of the principal thoroughfares of London, leading from the terminuses of the Northern Railways to the modern centre of London. But it stands back in its own quadrangle. Of the general appearance of the façade and of the quad so far as it has been completed an impression can be gained from the picture printed at page 33. A good deal must be done to the interior before it can be fitted to the purposes of the Association, and for this

the cordial co-operation of the distinguished architect, who has shown great interest in the project, has been secured. The building, however, which was erected as a college for the Theosophical Society, already provides much of what the Association needs; it has, for example, a large hall which will seat more than 500 people, or over 250 with desks, as for a Representative Meeting. The lease is for 200 years, and the terms secured by the Association must be regarded as very advantageous.

A change from its present premises was forced upon the Association by the growth of its work, especially in the Medical Department. The existing building was very substantially built, and is of course a most valuable asset, but it had become too small, and all the amenities the Association desires to provide for its members have been diminished, with the exception of the Library, which remains as the only room for the use of members not engaged strictly on Association business. The accommodation of the Library, too, had proved too small; the new building will enable excellent provision to be made for it, common rooms to be set apart for members, and ample office accommodation for the Medical Secretary's Department, the Financial Department, and for the Editorial Department. It is hardly necessary to say that the resolution to remove was only reached after very anxious consideration, but, as we have said, the necessity was obvious to all engaged in the central work, whether officers, members of committees, or officials.

The Association is, we think, to be warmly congratulated on its good fortune in acquiring a building which, even so far as it is at present completed, might almost have been designed for its purposes.

GUY'S HOSPITAL MEDICAL SCHOOL.

On July 2nd H.R.H. the Prince of Wales, President of Guy's Hospital, visited its famous Medical School for the purpose of opening the new anatomy, biology, and physics departments. This ceremony signalized the completion of the rebuilding of the whole school during the twenty-six years that have passed since the first block was opened by King Edward VII (then Prince of Wales) in 1897. The total cost of rebuilding the various departments has been upwards of £100,000. The latest extension occupies an area of 4,000 square feet; it consists of five floors, each communicating with the principal staircase of the main block. By transferring the physics department from its former site to the new building, space has been freed for biochemical research within the department of chemistry; and in designing the new quarters for the departments of anatomy and biology special accommodation has been set aside for research. On Monday afternoon the grounds of the hospital were filled with a very large company, who gave the Prince a warm welcome on his arrival accompanied by Viscount Goschen, treasurer of the hospital, Mr. H. J. Waring, Vice-Chancellor of the University of London, Sir Cooper Perry, Principal Officer of the University, Mr. H. L. Eason, superintendent of the hospital, Professor T. B. Johnston, dean of the medical school, and the senior members of the hospital staff. The ceremony took place in the "park," on the steps leading to the extension. After the treasurer had offered a formal welcome to His Royal Highness, the dean read an address briefly recounting the history of the reconstruction of the school, and expressing the hope that other benefactors would come forward in the future to relieve the school of its incubus of debt and enable it to carry on its work in a manner worthy of the traditions of Astley Cooper, Bright, Addison, Gull, and Wilks. The Prince of Wales expressed his pleasure at visiting Guy's to take part in celebrating this important event, and unlocked the door of the school with a gold key handed to him by Mr. W. J. Walford, architect of the extension. Dr. John Fawcett (senior physician) proposed, and Sir Alfred Fripp (senior surgeon) seconded, a vote of thanks to the President, who then made a brief tour of inspection of the new buildings. At the end of the formal ceremony a garden party was given by the governors and medical staff in the pleasant grounds of the hospital, and the laboratories, museums, college, the Henriette Raphael Nurses' Home, and the wards were visited by large numbers. Altogether this was a red-letter day in the annals of Thomas Guy's great foundation. The medical school has now been rebuilt, with ample accommodation for teaching and research. The next need is an adequate endowment fund. As the President of the hospital well said on Monday, science and industry are not enough; to fight germs you must have money.

THE MAYOS AND THE MAYO CLINIC.

THE discussion at the Section of Surgery of the Royal Society of Medicine last week on the surgery of the hepatic and common bile ducts is reported elsewhere in this issue (p. 18), and a full note of the paper with which the discussion was opened by Dr. William Mayo will be found at page 7. In the evening Dr. Mayo was entertained by the Section at dinner at the Hotel Cecil. Mr. James Berry, President of the Section, who was in the chair, gave the health of Dr. Mayo and sketched the origin of the Mayo Clinic at Rochester, Minnesota. The father of Dr. William and Dr. Charles Mayo was born in the neighbourhood of Manchester and was a student of Owens College; with his Scottish wife he went out to America and settled in the village of Rochester, which is within the region of the Mississippi Valley and therefore subject to devastating tornadoes. Such a cataclysm destroyed the village in 1883, but left the church standing; a religious sisterhood, in thanksgiving for the preservation of the church, founded, at the suggestion of Dr. Mayo, the small hospital of St. Mary's, and it was under their father's tuition that the two young men received their first introduction to surgery. Gradually there grew up under their hands a great clinic which had done much for the advancement of surgery and had been visited by many surgeons from many lands. Mr. Berry went on to speak of the readiness of both brothers to make themselves acquainted by personal visits with the methods of surgeons in all countries, and of the enthusiasm and indomitable energy with which they have carried on their own work at Rochester. Mr. Berry concluded by expressing the hope that the Mayo Clinic would continue to flourish after its founders had left it. Dr. William Mayo in his reply said that the permanency of the clinic was a matter to which he and his brother had given much thought. If it was to live the clinic must, they realized, command the services of men of ideas and training, and these men should be afforded adequate opportunities to perfect their own methods and to keep themselves fully informed of every advance of surgery elsewhere. To meet these fundamental requirements he and his brother had from an early stage put aside out of the fees they received one half, with the intention that this money, received from the people, should be returned to them by providing facilities for research and for the education of surgeons; in this way the people would be repaid, since they would be able to command the services of better surgeons. Funds were also accumulated from the surplus of the clinic. The staff numbered altogether 128, and every member of it, including the chiefs, was paid by salary. In this way a fund of about eleven million dollars had been accumulated,

partly by the annual payments from the sources mentioned and partly by the interest on investments. In order to ensure permanency it was resolved to associate the clinic with the University of Minnesota. The fund had been handed over to a board of eleven persons, six elected by the staff and five by the university. He passed on to speak of the importance of a close co-operation between English-speaking peoples, not only to ensure the advance of surgery but also, and chiefly, for the progress of thought in all nations. The common possession of the English tongue meant something more than speaking the same language; it meant thinking in the same way. There was fundamentally a unity of purpose and of ideas; it remained to ensure the full realization of this unity. Sir Berkeley Moynihan gave the toast of American surgery in a brilliant speech, in which he sketched the early history of surgery in England and in America, and the intimate ties which from the earliest days of American independence had existed between surgeons in the two countries. If an attempt, he said, were made to enumerate the characteristics of American surgery they would be found to be perfection of technical achievement, integrity of statement, fertility in new suggestions, and readiness to receive new ideas. The profession in America was unafraid of new adventures in action or thought, and in American surgery none held higher places than Dr. William Mayo and his brother. The toast was acknowledged by Dr. Donald C. Balfour, a member of the Mayo Clinic at Rochester, who gave a brief account of the efforts made, and in part completed, to improve the organization of medical education in the United States.

EARLY MENTAL TREATMENT AT A GENERAL HOSPITAL.

AT Middlesex Hospital on June 28th, two new wards, for men and women respectively, were formally opened for the treatment of functional disorders of the nervous system. These wards are to be worked in co-operation with St. Luke's Hospital for Mental Diseases, and the cases received will be under the treatment of the medical staff of St. Luke's and will be attended by St. Luke's nurses. This is believed to be the first instance in this country of an alliance between a general hospital and a special hospital for nervous disorders. The two institutions are to share funds, material, experience, and the services of the staff so far as may be necessary, and all the resources of a general hospital in the way of special examinations and of medical and surgical treatment will be available for these patients. Although the wards are for the reception of early mental cases which require in-patient treatment, it is not intended, nor would it be possible, to admit cases of insanity or mental deficiency, or cases of a kind which might cause annoyance to other inmates of the hospital; the patients in these wards will be under no more compulsion than those in the general wards. It is hoped that although the wards are small, and the cases treated must be few, the mere establishment of the wards will do something to break down the prejudice whereby mental trouble is severely isolated from all other human infirmities. The chief advantage of the arrangement will be that the environment of a general hospital is likely to react favourably upon patients and prospective patients, because such an institution will be approached by the patients with less hesitation and misgiving than a special mental institution often excites. The Earl of Athlone, Chairman of the Middlesex Hospital, welcomed the few persons present, chiefly members of the staffs of the two hospitals concerned, and extended a special greeting to the representatives of St. Luke's. He remarked that the importance of this interesting reform in hospital procedure was not to be measured by the number of beds at present available, but by the fact that the principle of co-operation between a general and a special hospital of this kind, several times mooted, had now taken practical shape. Mr. A. C. Powell, treasurer of St. Luke's, said that there was a very great future for such co-operation. He remarked upon the fact that Middlesex and St. Luke's came into existence almost in the same year, and the history of St. Luke's indicated the rise and progress of the new spirit in regard to mental disorder. Formerly the word "lunatic" was commonly applied to cases received at that hospital, but the word had now completely disappeared; the change was not a mere polite convention, but was significant of a new outlook, to which the departure at the Middlesex bore further witness. Other speakers added a few congratulatory words, and Dr. C. Hubert Bond expressed the interest of the Board of Control in this movement. He remarked that at all the great general hospitals of this country there had hitherto been an impervious screen, whereby all mental cases were banned from their doors. It was a matter of profound interest, therefore, to find this association of Middlesex and St. Luke's, and he looked forward to the example being followed, if not by every general hospital, certainly by all the great teaching hospitals of the kingdom. The visitors afterwards inspected the wards; each contains accommodation for two or three patients; a special effort has been made to suggest cheerfulness in decoration and furnishing, and the appearance is very comfortable and homelike. The wards are in a part of the hospital away from the general wards and their approaches, and they form a self-contained unit, with sitting room, kitchen, and store cupboards. Border-line cases will also be treated in an out-patient department.

THE LABORATORY DIAGNOSIS OF VENEREAL DISEASES.

THE first edition of the Medical Research Council's Report (No. 19) entitled "The Laboratory Diagnosis of Gonococcal Infections and Methods for the Detection of *Spironemum pallidum*" was issued in September, 1918, and proved to be one of the most useful of the reports upon pathological methods, but it has been out of print now for some months. A revised edition[1] has now been published, and though it follows closely the original plan it contains some new features and is excellently illustrated. Its object is to describe reliable methods for the laboratory diagnosis of gonococcal infections and to explain the technique of dark-ground illumination and the staining reactions which may be employed for the identification of the syphilis spirochaete. The first part, which deals with gonorrhoea, discusses the localities which should be examined for the presence of gonococci, describes the methods to be employed for the identification of the gonococcus in film preparations, advises on methods for the cultivation of the gonococcus, cautions against the procedure employed for the production of a focal gonococcal reaction, and considers the advantages, disadvantages, and limitations of the complement fixation test. The descriptions of the most satisfactory methods of preparing culture media for this delicate organism are detailed and explicit, and four different methods for carrying out the notoriously difficult complement fixation test are given. One of the best features of this part of the report is the frank discussion of the value of the evidence which may be derived from these different methods of investigation. In the second part of the report Mr. Barnard explains in simple language the principles underlying observation by dark-ground illumination and describes methods for setting up the apparatus. This was looked upon as one of the most useful sections of the first

[1] H.M. Stationery Office, or through any bookseller. Price 1s. 6d.

edition, and a direct and practical description such as this will be of great service to those endeavouring to master the technical difficulties of this branch of microscopy. Mr. Barnard describes a method he has recently devised for differentiating between *S. pallidum* and other spironema by employing on eyepiece graticule which provides a scale in reference to which the spironema under observation may be measured. Dr. Dobell contributes the final section on other methods of demonstration of spirochaetes—namely, stained films, Indian ink and Congo red methods and silver nitrate methods—and emphasizes the precautions which must be observed in order to secure satisfactory preparations. His argument on the correct nomenclature of the organism, commonly referred to as the syphilis spirochaete, leads him to the conclusion that its correct name should be *Spironema pallidum*.

BOTULISM.

A STUDY of the epidemiology of botulism, by Drs. Geiger, Dickson, and Meyer, has been published in Bulletin No. 127 of the United States Public Health Service. In view of the admittedly great difficulty—perhaps we might say impossibility—of obtaining an exact and exhaustive record of the occurrences of botulism, statistics of incidence are hard to interpret. This remark applies equally to rates of fatality, geographical distribution, and attribution to particular articles of food. In spite of these obstacles the investigators have collected some important data. The most detailed inquiry related to the Yakima Valley district of Washington. A careful survey demonstrated that within five years 7 outbreaks of human botulism, 27 outbreaks in domestic fowls, 26 in horses, 3 amongst cattle, and 1 amongst pigs had occurred. Of 26 human cases in the State of Washington, 18 were fatal. Home-canned corn, asparagus, and spinach were incriminated, and in one case commercially canned evaporated milk seemed to be responsible. Thirty of the outbreaks studied—32.9 per cent. of the available data—were verified bacteriologically. Regarding the relative proportions of the two types of organism, Type A has been isolated 38 times and Type B 13 times. In 11 outbreaks the diagnosis was established by the demonstration of the toxin of *B. botulinus* in the remnants of the incriminated food. The popular idea that food must always be visibly spoiled in order to be toxic is not entirely supported by the available observations, although in a majority of instances some abnormality was recognized. Instances of tinned beans, tinned spinach, and tinned minced olives occurred where no change was noticed. *B. botulinus* is a soil parasite in some localities, and the frequent occurrence of botulism in the southern section of California is apparently closely connected with the distribution in nature of the spores of the bacillus. A short account of the observations made by Professor K. F. Meyer in California, and also in this country, where he found *B. botulinus* five times in 64 samples of English soil, was given in the course of a review published on June 2nd (p. 932) of Dr. Gerald Leighton's book on *Botulism and Food Preservation*.

INTERNATIONAL INDUSTRIAL HYGIENE.

THE International Labour Organization for Industrial Health is an offshoot of the League of Nations. There exists in the public mind some considerable confusion as to its constitution and real function, and many of those who are better informed about its objects seem to have but hazy notions respecting the details of its activities. It was therefore a happy conception on the part of the League of Nations Union to bring together lately in conference representatives from authoritative bodies, interested in promoting industrial health and safety, and accredited representatives of the International Organization itself. A report of the conference appeared in our last issue (p. 1108). Its aim was by means of discussions and explanations to produce a better understanding of the work carried on in Geneva and of the ways and means by which the efforts and objects of the bodies particularly interested can be assisted by a co-ordinating centre. Among the members of the medical profession present at the various sessions were Sir Thomas Oliver, Dr. J. C. Bond, Dr. W. F. Dearden and Dr. Alfred Cox, representing the British Medical Association, Dr. D. McKail, Dr. T. Watts, M.P., and Dr. W. H. F. Oxley, representing the Association of Certifying Factory Surgeons, Dr. T. M. Legge, Professor E. L. Collis, Dr. F. E. Fremantle, M.P., Dr. C. S. Myers, Dr. Winifred Cullis and Dr. R. Legge (University of California). The scheme devised by the promoters was to select for discussion four of the principal industrial health problems now before the public; to have these introduced by well known British experts; to bring out under each heading how the International Organization could be useful. Mr. Harold Grimshaw, who occupies the position of Chief of the Diplomatic Section of the Central Office, was present at all the sittings and, during the course of the discussions as well as in a preliminary address, very ably fulfilled his particular task of making the situation quite clear so far as the International Organization was concerned. He pointed out that this body was not an amalgamation of Trade Unions or Soviets, but held place as a well defined unit in the League of Nations constitution established by the Treaty of Versailles. Its function was to secure by international action the adjustment of conditions of labour throughout the world to the requirements of justice and humanity; its constitution was made up by membership of subscribing States, at present fifty-four in number. At periodical conferences to which each State sent four delegates—one representing employers, one representing workers, and the other two directly representing the Government concerned—draft conventions were formulated, recommendations with a view to co-ordinating legislation in member States were drawn up, and scientific Commissions of Investigation were appointed. He explained how the permanent staff at Geneva, under the supreme direction of M. Albert Thomas, collected information from all quarters, both for the purposes of the conferences and for the use of subscribing States, and added that much of this would be available to properly accredited associations who cared to make application. He also intimated that the magnificent library of the Organization would be at the service of any properly accredited representatives of such associations visiting Geneva. Though no resolutions were brought forward, the conference seemed much impressed with the present and future usefulness of the International Organization.

TO HARROGATE BY PULLMAN CAR.

JUST four years ago, in a note on Harrogate and its eighty-seven different waters—"One sure, if another fails"—we mentioned the successful efforts then being made to improve the organization and equipment of British spas and bring their claims more prominently before our own countrymen.[1] The revival of Continental watering places since 1919 makes it desirable once again to remind the British medical profession of the advantages of our home health resorts, and to draw attention to the steps taken by the baths management and the railway authorities to attract patients to Harrogate. On Monday next a new fast train service between London, Leeds, Harrogate, and Newcastle will be instituted. These trains, which are made up of specially built Pullman cars, first and third classes,

[1] BRITISH MEDICAL JOURNAL, July 19th, 1919 (p. 78).

are timed to cover the 203¾ miles from King's Cross to Harrogate in exactly four hours. Each day during the season one of these most luxurious trains will leave London at 11.15 a.m., and another travelling in the opposite direction will leave Harrogate at the same time. A trial run, organized by the London and North-Eastern Railway Company and the Pullman Car Company, in association with the Harrogate Corporation, took place last week-end. The guests on the inaugural trip included representatives of the medical press and some twenty practising medical men, mainly from the metropolis. Entertainment on arrival at Harrogate was provided at the Hotel Majestic, where a banquet to celebrate the occasion was held on Saturday evening. The health of the guests, proposed by Sir Ernest Bain, chairman of the Wells and Baths and Publicity Committee, was responded to on behalf of the medical visitors by Dr. Fortescue Fox, and on behalf of the Harrogate Medical Society by Dr. David Brown, who drew attention to the work of the Royal Bath Hospital, a local charity, which celebrates its centenary next year. This institution of 150 beds extends the benefits of Harrogate baths and mineral waters to poor patients; it had been visited during the afternoon by a number of the medical guests, who examined the wards, the reorganized bath-house, and the laboratories. Dr. David Brown mentioned, as an indication of recent progress at the great Yorkshire spa, the winter classes held during the last two years by members of the local medical society for the training of bath attendants in the rudiments of anatomy, physiology, and electricity, and in the technical methods employed at the Royal Baths. These were inspected at leisure by the visiting party on Sunday morning. In various other ways the Harrogate bathing establishment has moved with the times, and, assuming support from the medical profession, the new Pullman car train service should deflect a considerable proportion of invalids from the Continental health resorts.

THE INTERNATIONAL SURGICAL CONGRESS.

THE sixth congress of the Société Internationale de Chirurgie will (as already announced) be held in London from July 17th to 20th under the presidency of Sir William Macewen. On Tuesday, July 17th, at 11 a.m. the congress will be opened by the Prince of Wales in the presence of the Foreign Secretary, the Minister of Health, and the President of the Board of Education. Many ambassadors and ministers will attend the opening ceremony, which will take place in the rooms of the Royal Society of Medicine. In the afternoon a discussion on the surgery of the endocrine glands (thyroid excluded) will be held. It may be of interest to describe how the discussions of the congress are arranged. Official reporters have been appointed, who will give abstracts of papers which have already been circulated in full. These abstracts may take not more than fifteen minutes. Then may speak for ten minutes those who have signified their desire to do so, and last, if there is time, any member of the congress may enter the discussion for not more than five minutes. The official reporters for 1923 are Drs. Bazy (Paris), MacAusland (Boston), Frazier (Philadelphia), Sauty (Lyons), Fraser (Edinburgh), Gosset (Paris), Sargent (London), Verge (Pavia), Hey Groves (Bristol); Quénu, Duval, Moquet (Paris); Crile (Cleveland), Almroth Wright (London), Willems (Liège), Bristow (London), Platt (Manchester), Henrikson (Skien), and Putti (Bologna). On the morning of July 18th there will be a discussion on arthroplasty; in the afternoon operations will be watched at the hospitals. The proceedings on July 19th will open with a discussion on the late results of peripheral nerve injuries, to be followed by the general meeting, and in the afternoon operations will be seen. On the morning of July 20th there is to be a discussion on vaccino- and sero-therapy (tetanus excluded), and on operative shock; after lunch, besides a programme of operations to be watched, there will be a demonstration on vaccino-therapy by Sir Almroth Wright at St. Mary's Hospital. All these meetings will be held at the Royal Society of Medicine. Entertainments have not been forgotten. The Ladies' Committee has organized visits to various places of interest in London, and an excursion to Hampton Court Palace and to Windsor. On Monday evening, July 16th, there will be a reception by the University of London. On the afternoon of July 17th Sir John and Lady Bland-Sutton will hold a reception, and in the evening delegates, members of congress, and friends will be received by the President, Sir William Macewen. On July 18th the Lord Mayor will give an evening reception at the Mansion House. On Thursday, July 19th, there are to be receptions by the President of the Royal College of Physicians and by the President of the Royal College of Surgeons at 4 and 9 p.m. respectively. On Friday, July 20th, there is the annual banquet of the society. After these somewhat strenuous four days the visitors will probably enjoy one of the two three-day tours which have been arranged. Each begins on July 21st. One is to the Shakespeare country and Oxford, the other to Bournemouth, the New Forest, Salisbury, Winchester, and Stonehenge. The Council of the British Medical Association has offered members the use of its Library and the services of its officials. The following are amongst the many distinguished surgeons attending the congress: Drs. Hartman, Martell, Lariche, Tuffier, Rovsing, Depage, Lamlotte, Willems, Schoemaker, Giordano, Putti, Soublotitch, Denegri, Bartos, Jonesco, De Quervain, W. W. Keen (who comes the doyen of American surgeons, president of the congress last year, a young man of 86), Lovett, and Matas. An interesting and novel badge has been found in a small medal bearing the figure of John of Arderne taken from a fifteenth-century manuscript. The British secretaries are Sir D'Arcy Power and Mr. J. E. H. Roberts. The offices of the secretariat are at 26, Harley Street, W.1.

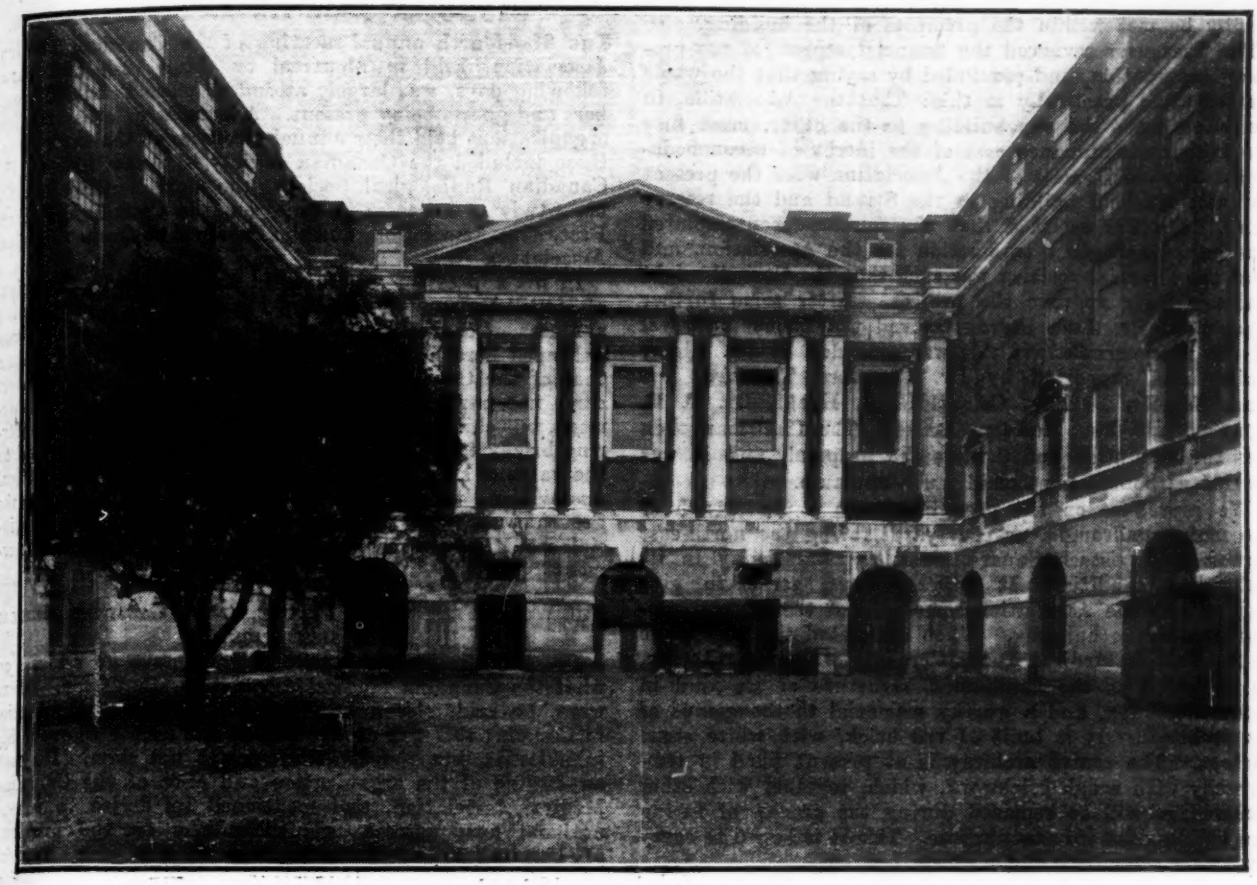
THE gold medal of the Royal Society of Medicine, which is presented triennially to a scientist, man or woman, who has made valuable contributions to the science and art of medicine, has this year been awarded by the Council to Dr. F. Gowland Hopkins, F.R.C.P., F.R.S., Professor of Biochemistry in the University of Cambridge.

THE Prince of Wales has accepted the invitation of the President and Council of the Royal Society of Medicine to be present at the Society's dinner on Tuesday, December 11th.

PROFESSOR PITRES, the well known neurologist and former dean of the Bordeaux Faculty of Medicine, has been elected a member of the Académie des Sciences Morales et Politiques.

THE chairman of the London County Council is making an appeal for support for the Children's Country Holidays Fund, which enables London elementary school children to benefit both physically and mentally by a fortnight's holiday in the country. This year, owing to the financial position of the fund, it has unfortunately been necessary to estimate for about 4,000 fewer children than were sent away last year. Donations should be sent to the secretary of the fund at 18, Buckingham Street, Strand, W.C.2.

OWING to the death of Dr. H. C. Ernst the *Journal of Medical Research* has become the property of the American Association of Pathologists and Bacteriologists. It will be devoted to the publication of original observations and investigations in pathology. The price is 5 dollars net for each volume in the United States, 5½ dollars net in Canada, 6 dollars net in other countries. The editor-in-chief is Dr. F. B. Mallory, Boston City Hospital, Boston, Mass., U.S.A., to whom all communications should be addressed.



THE BRITISH MEDICAL ASSOCIATION'S NEW HOUSE.
View of main quadrangle as it exists at present.

NEW HEADQUARTERS BUILDING FOR THE ASSOCIATION.

THE house of the British Medical Association (429, Strand) has for some years proved increasingly inadequate for the growing activities of its departments, and accommodation originally intended for the use of members generally has been gradually absorbed for business purposes. The position has been under consideration for some time, and the Council, at its meeting on April 18th last, adopted a resolution to the effect that the time had arrived when steps should be taken towards securing a British Medical Association building or site not only adequate for likely future office requirements, but also capable of providing small and large hall accommodation. The Council on the same occasion authorized the Office Committee to take steps towards obtaining increased accommodation and gave it power to enter into negotiations, including the taking of an option, if necessary. The Office Committee referred the matter to a subcommittee, consisting of the officers of the Association (the Chairman of Representative Meetings, the Treasurer, and the Chairman of Council).

At the Council Meeting on June 13th the subcommittee was able to report that it had examined a large number of sites, had obtained expert opinion upon several of them, and had come to the conclusion that the most suitable course was to enter into negotiations for a site on the Duke of Bedford's Estate in Bloomsbury. There was already upon it an imposing building, designed by Sir Edwin Lutyens, R.A., for the Theosophical Society; this building had been completed up to a certain point when it was taken over by the Government. It was used by the War Office during the war as the London Command Paymaster's Office. Afterwards it was handed over to the Disposals Board.

The Finance Committee, after long consideration and consultation with various experts, resolved unanimously to instruct the Treasurer to accept an offer by the Disposals Board of the lease of the college for 200 years from March 25th, 1920, and to continue negotiations with the trustees of the Bedford Estate concerning certain complementary ground, with a view to obtaining possession of the frontage of about 140 feet to Tavistock Square and Upper Woburn Place.

The meeting of the Council on June 13th was interrupted in order that the members in a body should inspect the building. On the resumption of business the Chairman of Council gave a brief account of the many inquiries that had been made with regard to various sites, and showed plans of the site now selected and of the college building upon it. He pointed out the advantageous position of the site abutting upon one of the chief north and south thoroughfares in London, in close proximity to the chief railway termini from the North (King's Cross, St. Pancras, and Euston), and lying practically equidistant from the Underground Stations at Euston Square, King's Cross, and Russell Square. He said that at 429, Strand, the Association had accommodation represented by just under 18,000 square feet of floor space. It was estimated that any new premises ought to have a total of 42,000 square feet. Both these figures excluded the space required for corridors, entrance, lift, etc., and the estimated requirement included provision for a large conference room, and for the proper housing of the library, as well as for adequate Council and committee rooms. The building which the Council had just inspected had a total floor area of 58,000 square feet, including passages, lavatories, and so forth. Standing on an ample site, the provision of full social facilities for members in the way of meeting rooms, and even all the amenities of a club, were within its scope.

The modern demand for garage accommodation could readily be met within the precincts of the building.

The Treasurer reviewed the financial aspects of the proposed transaction, and concluded by saying that the whole matter came practically to this: That the Association, in removing from the one building to the other, must face the higher maintenance cost of the increased accommodation. The chief assets of the Association were the present valuable freehold building in the Strand and the reserve fund. He was satisfied that the purchase contemplated was an advantageous transaction for the Association, and that the financial position was such that the Council might unhesitatingly approve the project. After some further discussion, Dr. John Stevens moved the formal approval of the recommendation; this was seconded by Dr. Ridley Bailey and supported by Dr. Crawford Treasure, Dr. Radcliffe, Dr. Darling, Colonel C. B. Heald, Dr. C. E. Douglas, and Mr. McAdam Eccles. The Chairman then put the resolution sanctioning the proposal, and it was carried without dissent amid much applause.

We reproduce on the preceding page a photograph of the main quadrangle, or courtyard, facing the north-east corner of Tavistock Square, as it appears to-day in its unfinished condition. It will, perhaps, serve to give members of the Association some idea of the general proportions of the building. When completed the new house of the British Medical Association will, we venture to say, be regarded as the handsomest structure of its kind in modern London, and a worthy memorial to the genius of its architect. It is built of red brick, with white stone facings. The centre archway is at present filled in temporarily with rough brickwork, which, together with other makeshifts, will be removed during the process of fitting the building for its new purpose. This it is hoped to carry out under the advice of Sir Edwin Lutyens.

GOLF COMPETITIONS AT THE ANNUAL MEETING.

THE British Medical Association holds each year a golf competition wherever the Association happens to be holding its annual meeting. In the past members have only had the privilege of playing for one cup—namely, the Ulster cup, presented to the Association by the Ulster Branch, and first played for during the annual meeting at Belfast in 1909. This year, by the kindness of the President-elect, who has presented the Childe cup, members will compete for two cups. Both will be played for during the same round. The Ulster cup is open to all members of the Association, the maximum handicap allowed being 18; the Childe cup is open to all members of the Association who have a handicap of 10 or over, 18 being the maximum again allowed. Play in both cases is against bogey. If the Ulster cup is won by any competitor with a handicap of 10 or over, the Childe cup will be presented to the player (with a handicap of 10 or over) with the next lowest score. The Portsmouth Division has kindly offered to present small memento cups to the winners of both the Ulster and the Childe cups.

Conditions of play are as follows:

1. One round of 18 holes to be played on Thursday, July 26th, by kind invitation of the Hayling Golf Club at their course on Hayling Island.
2. Competitors are not permitted to put in previous play on the course on the day of the competition.
3. Intending competitors are required to furnish with their entry a certificate signed by their club secretary stating (*a*) their lowest handicap, (*b*) the bogey score of their own course, and (*c*) the length of their own course.
4. Entries to be made at the Reception Room before 4 p.m. on Wednesday, July 25th.
5. Competitors may choose their own partners, although partners will be arranged for by the committee on notice being given at the time of entry.
6. Play to commence at 10 a.m., no cards to be issued after 3.30 p.m.

It is hoped that all members who attend the Annual Meeting and who play golf will enter for these competitions. Lunch will be served at the club house, and by kind invitation the competitors will be entertained at tea in the afternoon.

CANADIAN MEDICAL ASSOCIATION.

THE fifty-fourth annual meeting of the Canadian Medical Association, held in Montreal on June 12th and three following days, was largely attended, more than 800 members and guests being present. A number of other medical organizations held their annual meetings at the same time; these included the Canadian Society of Anaesthetists, the Canadian Radiological Society, the Canadian Society for the Study of Diseases in Children, the Canadian Medical Protective Association, and the Province of Quebec Medical Association.

In his address of welcome Sir Arthur Currie, Principal of McGill University, said that Montreal was fast becoming a Mecca of conventions, but no convention that had been welcomed here had brought more honour to the city than that of the Canadian Medical Association, whose members came not particularly for their own pleasure or advancement, but chiefly that the community might benefit. Referring briefly to the aims and ideals of the profession and to the value of such an organization as the Canadian Medical Association, the Principal expressed the hope that the general public and the Government, Dominion and Provincial, would take a more active interest in medical advancement.

THE WORK, PRESENT AND FUTURE, OF THE CANADIAN MEDICAL ASSOCIATION.

Dr. Malcolm MacEachran of Ottawa gave an address on what the Canadian Medical Association stands for. There were, he said, eleven hundred doctors in actual practice in Canada; this was an average of one doctor to every 863 inhabitants, but the distribution was not even. He gave an outline of the organization and aims of the Canadian Medical Association, and mentioned its desire to possess national headquarters. He spoke also on the problems of hospitalization, transportation of the sick, medical education, training of interns, and the better correlation of preventive and curative medicine.

It was arranged for lecturers to visit various provincial centres to speak on the most recent developements of medicine and surgery. The three lecturers appointed were Dr. F. W. Marlowe of Toronto, Dr. F. J. Tees of Montreal, and Dr. T. C. Routley, Secretary of the Association. It is planned to start at Victoria, B.C. on July 3rd. The centres visited will be Vancouver, Edmonton, Calgary, Saskatoon, and possibly Moose Jaw and Winnipeg. Drs. Marlowe and Tees will give scientific addresses and Dr. Routley will speak on organization work. Three representative committees were appointed to study questions relating to medical education and legislation. It was suggested that a medical conference be held some time during the coming winter with a view to bringing together all bodies in Canada interested in such matters.

The distribution of the doctors throughout the country is a vexing question. Some districts are almost totally without medical aid, whilst in other parts of the country the supply exceeds the demand. It is hoped that the association will take up the matter seriously and suggest a remedy to relieve the situation.

Men without medical qualifications are presuming to practise medicine in the west, and this usurpation of privileges is spreading to the east, to the general lowering of the standards of the profession. The Hon. J. D. McLean, M.D., Provincial Secretary and Minister of Education and Railways, British Columbia, told the members of the Canadian Medical Association that there was need for strenuous fighting to eliminate this scourge of the profession. "One difficulty we have in our province," he said, "and one that you will have in the eastern provinces in times to come, are the followers of many cults who are presuming to practise medicine. There are some men practising medicine to-day who are not as well educated along medical lines on which they are practising as they ought to be. Precautions must be taken and some methods adopted whereby these men shall be brought to a higher standard of efficiency. It is a question that men will have to face in eastern Canada as we are facing it now in the west and in the Western States of the

United States. Judging by my observations, there is one thing the medical profession must do: there must be to some extent a house-cleaning."

Following Dr. McLean, Dr. R. W. Powell of Ottawa, president of the Canadian Medical Protective Association, referred to actions taken by the Protective Association for malpractice, negligence, or want of skill. "As we go on," he said, "the greater we see the value of organized defence, of straightforward fighting, of no compromise."

In submitting the report of the general council of the Protective Association Dr. F. Fenton Argue expressed the belief that the limiting of the association work to its members had brought matters to a pass where a change of policy had become necessary. On the motion of Dr. W. G. Reilly a resolution was passed unanimously calling upon the executives of the Medical Association and the Protective Association to confer, in the hope of evolving a scheme by which membership in the former association would carry with it the protection afforded by the latter association.

The affiliation of the Medical Association of the Province of Quebec with the Canadian Medical Association was confirmed, which means that all of the nine provincial associations are now linked up under the Dominion organization. The making of the Canadian Radiological Society a branch of the Canadian Medical Association was also approved. The members decided to petition the Dominion Government to increase for income-tax purposes the deductable sum for dependent children to 500 dollars. It was decided to hold the next annual meeting (1924) in Ottawa. The following officers were elected for the ensuing year: Dr. John F. Kidd of Ottawa was named president; Dr. A. D. Blackader was elected editor of the *Journal;* Dr. A. T. Bazin was made honorary treasurer, and Dr. T. C. Routley of Toronto general secretary.

Clinical and Scientific Proceedings.

The clinical and scientific work of the meeting was carried out in sections, including pathology, dietetics, diseases of the ear, nose, and throat, and radiology, and at general meetings. At one of these Dr. S. A. Kinnier Wilson gave a history of the National Hospital for the Paralysed and Epileptic in Queen Square, London, sketched the work of the men that made it, and described its organization.

A discussion on infection of the hand was very largely attended. The chief speakers were Mr. I. MacLaren Thompson, Department of Anatomy, McGill University, who dealt with the anatomical structure of the hand. Dr. W. A. Ferguson spoke on the development of treatment in infections, showing the advance made in scientific management of traumatic injuries. Dr. D. D. MacTaggart, Professor of Medical Jurisprudence, McGill University, dealt more particularly with disabilities of the hand in their economic relationship.

Dr. William J. Mayo (Rochester, Minnesota) gave an address on the septic factors in tuberculosis, syphilis, and carcinoma; with regard to the latter he said:

"Glandular involvement in carcinoma tells the story. While operative skill and technique are important, generally speaking, results show that, without regard to the type of operation, five-year cures occur in 71 per cent. of cases in which an operation has been performed for carcinoma before the glands are involved, and in only 19 per cent. after they are involved. Local operations cure local disease; massive operations fail when the local stage has passed. The associated sepsis in cancer is the cause of much of the distress, and hurries the patient to a fatal end. We all recognize the dangers of operation on the infected, so-called inflammatory cancers, such as those around the mouth. The use of the knife in these cases is often followed by rapid recurrence. Cautery excision in these cases, followed later by plastic repair, is a step in the right direction. There are many men who, with a small amount of radium, do little good and an enormous amount of harm. With good faith, but poor judgement, they apply radium in cases in which an operation should have been performed early. Generally speaking, the use of radium means the parting of the ways. If radium is selected, one can seldom turn back and take the operative route with a good prospect of success."

Sir William Taylor (Dublin) followed with an address on intestinal obstruction.

Dr. Luther C. Peter of Philadelphia was the first speaker in a discussion on the diagnostic value of modern perimetry in disease of the visual pathway, and Dr. W. G. M. Byers of Montreal spoke on the treatment of tuberculosis of the eye. The surgery of the mastoid was dealt with by Dr. Edmund Boyd of Toronto; and unusual findings, with pathological specimens, in the neuro-otological examination in a verified brain tumour in a child was discussed by Dr. D. E. Staunton Wishart, also of Toronto.

A discussion on insulin and diabetes was opened by Dr. F. G. Banting of Toronto, and it was subsequently announced that the Federal Government would be asked to recognize suitably the work of Dr. Banting and his collaborators, including Dr. C. Best; and that some special recognition should be given also to Professor Macleod, in whose laboratory in Toronto the work was done, and to Professor Colip.*

Dr. J. S. Fraser, surgeon to the Ear, Throat, and Nose Department of the Royal Infirmary, Edinburgh, gave an address on diseases of the ear. Sir Robert Jones gave a demonstration on orthopaedic surgery, in the course of which he discussed several series of cases of surgical tuberculosis, club-foot, and other deformities, which had been collected for him, and indicated the treatment he recommended in each. The demonstration was attended by over 500 members, who, at the conclusion, expressed their appreciation of the demonstrator's efforts.

The Canadian and the British Medical Associations.

The Council of the Canadian Medical Association proposed that an invitation should be given to the British Medical Association to visit Canada so that a joint meeting of the two Associations might be held. In placing the matter before the meeting Dr. C. F. Martin, President of the Canadian Medical Association, said that a set of questions had been sent out to members asking whether they approved such an invitation. Of the replies received 1,228 were in the affirmative and only 28 in the negative. This statement was received with cheers, and the proposal was unanimously approved.

Dr. C. F. Martin afterwards presided at a luncheon given to Lord Shaughnessy and Sir Robert Jones. More than 300 members of the Canadian Medical Association were present. Afterwards Sir Robert Jones gave a short address on the imperial relationships of medicine. In the course of his remarks, he said:

"I cannot imagine any theme more likely to prove the next and perhaps the greatest chapter in the history of medical science. I also cannot picture any subject that would respond to the hopes and aspirations of us all more deeply. But it is a very great idea, and I cannot aspire to do more than emphasize an aspect that possesses immediate importance.

"First of all, what is meant by imperialism? There is no denying that, before the great war made the word synonymous with comradeship, there was a certain antipathy and suspicion towards the very name, principally founded upon a false conception of dependence. The war, out of its long agony and affliction, produced one progressive and not simply destructive achievement—it cemented imperial relationships. It was in that sense a challenge. It proved as never before that dependence one upon another in a common cause is a greater and more progressive ideal than isolation. It proved in our particular civilization the profound possibilities of team work; it taught us all the lesson, in other words, of unity of effort founded, not upon jealousies, water-tight compartments, or indifference, but upon comradeship and high ideals.

"The war has gone, and with it much of its dramatic and urgent challenge. But in its place is the infinitely more permanent challenge of peace. Is all that enthusiasm, fraternity, and unbounded promise to evaporate and pass into a tepid tolerance? Does it require the stringency and destruction of war to make an ideal common to us all more than an individual occupation? Surely not. Without question every effort should be made to maintain our past and present relationships.

"Consider under such an idea—so reasonable and so inevitable—the prospect of a closer alliance between the British and Canadian fields of medicine. I admit that on the grounds of sentiment alone the promise of such co-operationship possesses a peculiar and lofty idealism. The tie between the medical traditions of your land and the land of your fathers recalls those ancient institutions at which they were taught. Nor is there any need for me to remind you how deeply the profession in Great Britain respect you and how concerned they are for the greatest possible unity with you. I was asked to make the point as clear and to emphasize it as strongly as I am

* It is now reported that the Ottawa Parliament has voted Dr. Banting an annuity of 7,500 dollars.

able, and I do so now more gladly than I can say and less eloquently than I wish. There is, I know, nothing but goodwill on your side; it has been shown too plainly for misconstruction.

"Certain conclusions occur to me as an outsider. I am not here to formulate machinery for closer co-operation, for the simple reason that if the determination and goodwill are there, such technicalities come within the work of the committees concerned. All that can be emphasized, as I trust it will by our friends on this side, is the realization that progress is won not so much by independence as dependence one upon another. There is no question of interference with your autonomy or ours, any more than with our colleagues in Australia, New Zealand, or Africa. Out of such an alliance, who can tell what may not come in the future? but it is enough for us that our ideal should be that of a large family distributed, as is the way with large families, throughout the world, each master in his own house, but each with a sense of more than goodwill concerning the other habitations, and even a kind of family pride in their success and a loyal fellowship in their troubles."

The cablegram sent on behalf of the Council of the British Medical Association, as stated in a Current Note published last week, was read and very cordially received by the company. The letter addressed to the President of the Canadian Medical Association by the Chairman of Council, confirming the invitation, will also be found in the SUPPLEMENT of last week.

MEDICAL PRACTICE IN THE SCOTTISH HIGHLANDS.

THE most interesting part of the newly issued fourth Annual Report of the Scottish Board of Health[1] relates to the work of the practitioners under the Highlands and Islands (Medical Service) Grant Act, 1913. The Board states that there are signs that medical practice in the Highlands and Islands is growing increasingly attractive to doctors. For posts recently advertised there have been unexpectedly numerous applicants, and those who had left the area show an inclination to return. The report goes on to say that, apart from improved finance, the increasing popularity of the service is believed to be due, at least in part, to the sympathetic attitude of the British Medical Association and of its Highlands and Islands Subcommittee. Also, of the more recently qualified doctors who have been employed in emergency and holiday service in the Highlands, a proportion seem inclined to seek permanent posts, the temporary work having been to their liking. The result is that the service is now practically at full strength except in a few districts of exceptional difficulty owing to lack of suitable houses, or other reasons. For example, in the Island of Lewis one district of 354 square miles with 11,000 population has only two doctors, on account of want of houses; in another area it is very difficult to get a building site sufficiently level and free from rocks, while the hunger for arable land creates objection to giving up a feasible patch large enough to hold a house.

Special financial arrangements have had to be made for some isolated communities too small to occupy the full time of a doctor. Among the examples given of the difficulties encountered, that of Fair Isle, situated midway between the Orkney and Shetland groups, may be quoted. Down to the end of 1922 each visit to the island meant 150 miles of sea travel; a new arrangement for attendance from the south of Shetland is better, but it will require 50 miles by sea for each visit, or 100 miles if the boatman has to come from the island; the crossing includes Sumburgh Roost, where the troubled sea is kept in constant turmoil by the meeting of two tides. Such island work indeed is largely at the mercy of storms and fogs. On the Fair Isle a medical officer was recently fogbound for a week, and on the remote island of Foula another was detained for four days last July. Here is a striking account of a case in which, notwithstanding every effort, the weather rendered it impossible for a medical officer in Portree (the capital of Skye) to make a visit to a patient in the Island of Soay, to the south of Skye:

"I received a telegram from Elgol on Friday morning asking me to go to a man (on the Island of Soay) who had damaged his eye. . . . I had several patients in at the time who had come from North Raasay to consult me, and they kept me until about 12 o'clock noon. I then set out for Soay, but had to see an important case in Portree before going. . . . On the road to Glenbrittle, the last eight miles of which is very rough, I had considerable tyre trouble involving a good deal of delay, so that I did not reach Glenbrittle until about 4.30 p.m., when it was beginning to get dark. On finding that the boat from Soay was not at Glenbrittle to meet me I went to the guide at Glenbrittle and asked him to guide me across the hill—a distance of about three miles—to the place from which one can signal (by lighting a fire) to Soay for a boat. The guide refused to undertake the journey in darkness on account of the dangers. I may say that there is no track, and that there are three streams to cross, over which there are no bridges. I waited all night at Glenbrittle. During the night and in the morning heavy rain fell and a strong wind was blowing. When we again set out we found that the streams were quite impassable, and I then decided to try to cross from Elgol. I came back to Sligachan, and from there wired to Elgol asking if I could get across to Soay from there. While waiting for the reply I had again to change my tyres, borrowing one from a passing car. I received a reply from Elgol that it was impossible to cross to Soay that day."

The fund provided by the Act has been applied to medical service, nursing service, houses for doctors and nurses, hospitals and ambulance service, telegraphs and telephones, a special emergency scheme, and a special tuberculosis scheme.

The object of the medical service, it may be recalled, is to secure that distance of doctor from patient shall not add anything to the charges to be paid by the patient; small fixed fees, no matter what the distance is, are paid for first visits and for subsequent visits, and the doctor is subsidized from the fund to meet the deficit, usually by an annual grant, but in a few cases by a guaranteed income. The payments to doctors are under three heads, and for 1922 the amounts were estimated as follows: (1) Scheme of modified fees and special arrangements, £44,000; (2) supplementary scheme (mileage) £1,120; (3) holiday relief, £855.

It is to be understood that the Highlands Act is not in substitution for the Insurance Act, but in supplement. The Act owed its inception to the Scottish Insurance Commissioners, who, after their appointment, speedily realized that the Insurance Act fell far short of meeting the case of the Highlands, where the chief occupations—especially fishing and crofting—are not carried on under any contract of service. The Commissioners accordingly made a representation to Government, and a committee of inquiry was appointed; its report was followed by the passing of the Act. Last year the nursing service was expected to cost £8,500, houses for doctors and nurses £3,199, and hospitals and ambulance service £700. The annual grant is only £42,000, but owing to the war some of the contemplated services remained largely in abeyance, so that the fund rapidly increased. At the beginning of last year it was £172,624, but by the end of the year it had fallen to £143,459. In a very few years, therefore, Parliament will be faced by the fact that the funds will not nearly meet the outlay. Indeed, the expenditure in 1922 considerably exceeded the estimates above mentioned, medical services having cost £63,798, and nursing services £10,206. But of the benefit to the population of the Highlands and Islands there can be no doubt whatever.

As pointed out in an article on "The country practitioner" (May 26th, p. 904), the Highlands Fund is not the only subsidy outside the Insurance Act to medical service in Scotland. For specially difficult and remote parts of what are technically the Lowlands—parts of Aberdeen, Banff, Dumfries, etc.—there is a Necessitous Districts (Lowlands) Grant, devoted to removal to hospital, transmission of messages, establishment of doctor, subvention to income, means of conveyance, maintenance of dispensary, difficulty of access, and footpath miles. The total outlay must be quite small, but no figure is mentioned in the report. The principle, however, is of much importance—namely, that in the public interest medical and related services in sparsely populated and difficult areas may be specially assisted by grants voted by Parliament and administered by the central health authorities.

In a later article we hope to refer to the parts of the Board's report dealing with the Insurance Act.

[1] Fourth Annual Report of the Scottish Board of Health, 1922. Presented to Parliament by Command of His Majesty. Edinburgh: Published by H.M. Stationery Office. 1923. (Cmd. 1887.) Price 5s. net.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

The Ministry of Health for England and Wales.

A YEAR'S WORK.

PRACTICALLY the whole of the sitting of the House of Commons on June 28th was taken up by a discussion on the vote for the Ministry of Health. Mr. Neville Chamberlain, in illustration of the economic importance of public health, mentioned that among the insured population in 1922 upwards of 19,500,000 weeks were lost by sickness. This was the equivalent of loss of work by 375,000 persons for a whole year. But only by adding the corresponding figures of uninsured people, whatever these might be, could be estimated the full importance of a preventive health service. An examination of vital statistics was encouraging, especially when allowance was made for the exceptionally hard conditions of life during the last three or four years. The death rate in the first ten years of the century was 15.4 per 1,000; in the next ten it fell to 14.3; and last year to 12.8. In the five years 1910–15 the infant mortality rate was 111 per 1,000; in the next five it was 90; in 1921 it was 83; and last year it was 77. A baby born to-day could expect to live twelve years longer than its grandfather could have hoped.

It was thought by many that tuberculosis and cancer were the most fatal diseases, but that was far from being true. Respiratory diseases, such as pneumonia and bronchitis, came first in fatal effects. This high mortality was to be attributed to the congested conditions and polluted atmosphere of the large towns. After a thick fog the death rate in London went up. He hoped that before very long he would be able to introduce legislation to help the campaign for cleansing the atmosphere. Next in fatal effects were diseases affecting the heart, and third came those of the nervous system.

Cancer, which now caused 96 per 1,000 of all the deaths from all causes, was fourth, and there was no doubt, unhappily, that deaths from this disease were increasing. In 1900 the rate per million of the population was 823; ten years later it was 967, and in 1921 it was 1,215. The figures were very disquieting despite allowance for better diagnosis and the fact that more people reached the span called the cancer age. The Ministry of Health had a standing Medical Committee on cancer, and researches were being carried on by the Cancer Research Fund, Middlesex Hospital, and the Cancer Hospital, Fulham Road. In addition, the subject was under the constant attention of the Medical Research Council, and there had lately been started another body—the British Empire Cancer Campaign. If this organization could succeed in co-operating with the existing bodies and form some co-ordinating influence, he would heartily welcome its existence and be glad to give it his support.

The position with regard to tuberculosis was more encouraging. The deaths per million last year were only 855 as compared with 2,653 in 1867. With regard to M. Spahlinger's claims to cure tuberculosis, Mr. Chamberlain said that he had offered to M. Spahlinger to make a full and sympathetic examination of his method so soon as the serum and vaccine were supplied. Mr. Chamberlain afterwards referred appreciatively to Professor Dreyer's researches reported in our columns on June 23rd (p. 1065). Statistics of venereal diseases, Mr. Chamberlain said, showed that they were fairly rapidly on the decline. He attributed the improvement largely to the setting up of clinics; 191 were now in existence, and it was hoped to increase their number. The report of Lord Trevethin's Committee seemed at last to offer some basis upon which two schools of thought might work harmoniously in the future for the common good.

Owing to vaccination small-pox had for some time been almost extinct. In 1917 there were only 7 cases, but lately there had been a serious revival—in 1922 upwards of 973 cases, and this year, down to June 16th, 955. It was important not to lose sight of the fact that a mild type of small-pox might presently become much more severe. He considered the situation distinctly serious. Twenty years ago 75 per cent. of children were vaccinated and now only 38. There was a possibility of an outbreak, which if it occurred would not only be dangerous to health and life, but would certainly inflict very serious damage and injury upon the commerce of the country. The one sure protection was vaccination, and those who refused it and advised others to refuse it were taking a very grave responsibility.

Referring again to infant mortality, Mr. Chamberlain said that the satisfactory figure of 77 per 1,000 for 1922 still meant the death of 60,000 children under 1 year. On the other hand, if the rate had been what it was in the first ten years of the century, the deaths would have been 100,000. Besides the actual saving of life there was an improvement in the general health of the children. He ascribed this in great measure to the establishment of the infant welfare centres; there were now 1,950 in the country. There was need, however, for more centres, more pre-natal clinics, more free medical attendances, and more health visitors and improved practice in midwifery. Results already achieved proved that the expenditure of more money in these directions would be well worth while.

Dealing with the voluntary hospitals, Mr. Chamberlain said that the Commission had expended about £425,000 of the half million sterling voted by Parliament. It had now practically cleared off all the deficits for the year 1921, except in a few cases in which the equivalent amount of money could not be raised. While it was a fact that a good many voluntary hospitals had been obliged to realize their realizable assets, and had therefore reduced their reserves to a minimum, a considerable number were able to balance their accounts. A hopeful feature was that while expenditure had increased there had been increased mass contributions from factories and societies, but the situation was still serious. Every hospital had a terrible waiting list, and the growth of population had to be coped with. One way in which relief could be given to the hospitals was through Poor Law infirmaries, which had improved greatly in recent years both in equipment and method of treatment. Some had appointed consultant medical staffs, others had attached to them convalescent homes, and others had taken paying patients at fixed fees. In London they had 18,000 beds, and he hoped they might be able to help the hospitals. In conclusion Mr. Chamberlain said that the estimates had been reduced in the last two years by nearly £4,750,000, and he thought they had got almost to the end of possible reduction.

Mr. George Lansbury joined issue with Mr. Chamberlain in regard to vaccination, and Sir Kingsley Wood said that a great defect in the panel system was that only about half the general practitioners of the country had taken service under the Act. There were far too many patients on the doctors' panel lists. He suggested that insured persons should be able to change at any time. Another complaint he ventilated was as to the surgery accommodation. Mr. Charles Roberts agreed as to the possibility of improving the panel system, but thought that it was largely due to it that the statistics were so much better.

Sir George Berry was sorry that the Minister had not said anything about milk sterilization. In Denmark it was the law. He regarded the neglect of vaccination as criminal. Mr. Werne, Viscountess Astor (who urged that the Minister should pursue a clean milk campaign), and Dr. Watts were subsequent speakers. The last named, taking up the antivaccination argument that the decline in small-pox was due to improved sanitation, said that scarlet fever, small-pox, and measles had been subject to the same sanitary conditions, but scarlet fever and measles had continued, whereas until last year small-pox had nearly died out. At present the parents of every child over the age of 6 months must produce certificate of vaccination or one of conscientious objection. Parents did not trouble to get even the latter. He could not recall half a dozen prosecutions of late. He asked that the law, such as it was, should be carried into effect. As to the Spahlinger treatment, he feared that Mr. Chamberlain's statement was not quite accurate. M. Spahlinger had worked for twenty years on his method. He had spent the whole of his private fortune upon it. Unless he had help in a few weeks his establishment and apparatus would have to be sold. In reference to the panel system, Dr. Watts said that now the work was cheerfully and efficiently done.

Sir Alfred Mond said the experience of the world was practically in favour of vaccination. It was in accord with the whole trend of the modern scientific treatment of disease. In 1874, when in Russia there was compulsory vaccination, small-pox did not exist; last year it was growing. The sanitary conditions of Mexico were terrible, but small-pox had almost died out owing to vaccination. He hoped that the Minister would exercise his fullest powers in this connexion. Maternity and child welfare work should be developed; the whole question of the medical treatment of children required co-ordination. For the Minister of Health to deal with a child up to a certain age and then to hand it over to another department was unscientific and uneconomical, and there was still a great overlapping in medical services. The linking up of ordinary hospitals with the other institutions for treating the sick was needed. The same difficulty had been found by him when dealing with the problem of National Health Insurance. The medical service up to a point was satisfactory, if not perhaps ideal, but what was wanted was to build up from the panel doctor to the specialist. A full inquiry should be held into the working of the National Health Insurance system; experience had demonstrated both its good and its weak points. It had been one of the greatest measures of social welfare ever introduced into this country, and no one doubted that it had come to stay. He thought that a committee of inquiry might overhaul the machinery and see what further developments were required. It could work with knowledge of the report of the committee which he set up when Minister of Health to deal with the possibility of amalgamating National Health Insurance and the administration of unemployed insurance.

Major Molloy, speaking as a member of the medical profession and not a panel doctor, said his experience showed that the work

done by them in the vast majority of cases was extremely good. The support given to cancer research was inadequate. To be efficient it must have the support, supervision, and sympathy of the Ministry of Health.

Lord E. Percy, on behalf of the Ministry of Health, said he thought it was obvious that the Government must give adequate assistance to the work of cancer research. Dealing with criticisms of certain reductions of expenditure, he said that for tuberculosis work it was about 3 per cent., but prices and cost of administration had gone down more; the actual service had expanded. The reduction in the amount for maternity and child welfare was about 15 per cent., but he believed that there also the cost of administration had gone down more than the reduction in the estimate. The service was to be as efficient and widespread as last year.

After reference by several Labour members to the effect of crowding on the spread of tuberculosis, Mr. Falconer, a Scottish Liberal, offered some criticism of panel doctors, while agreeing that the majority recognized their obligations. Sir Walter Preston feared that proper steps were not being taken to deal with the outbreak of small-pox in Gloucester, and gave his reasons at some length. Mr. Clynes summed up the debate on behalf of the Labour party, and incidentally returned to a charge made by Mr. Lansbury that under recent restrictions no child over 12 months got milk. Lord E. Percy, interposing, read the terms of the circular issued as long ago as March 31st, 1921, under which milk may be supplied to children up to 3 years of age, and exceptionally to children between 3 and 5 years of age.

Mr. Chamberlain agreed with Sir Alfred Mond that the panel system, whatever might have been its defects and faults, had done very valuable service by raising the standard of medical attendance among the poorer classes, but he did not question that it could be improved. Since 1920 much had been done to strengthen the weak places and to correct some of the faults disclosed in the course of experience. An attempt had been made to obtain a ubiquitous service, so that any insured person wherever he was might always be able to obtain the services of a panel practitioner; that was secured by a system of remuneration not dependent on the payment of a fixed sum per person. An endeavour had been made also to secure that patients should not be charged for any services properly within the scope of the service, and that the accommodation of the surgeries should be adequate and sufficient; it was one of the matters it was hoped to improve in the course of the next year. Mr. Chamberlain also referred to the appointment of regional medical officers to act as consultants. With regard to new terms to apply when the present terms of remuneration came to an end in 1924, the Ministry of Health had had a number of discussions already on such subjects as the limitation of a panel; that there should be no private fee for services within the scope of the contract; that there should be greater freedom in the choice of doctor; and that the Ministry should be able to secure that proper records were kept of each case. When agreement was reached on various points the Ministry would have to go into the question of remuneration. This matter would be discussed in the House sooner or later, very probably in the course of the autumn session, because it was most likely that further legislation would be necessary to put into operation the new arrangement. It would be unfortunate if the announcement of the coming of any thorough drastic inquiry in the whole system were to postpone the settlement of various questions he had mentioned or delay the settlement coming into operation. It would be necessary at some time or other to have an inquiry such as Sir Alfred Mond had suggested, but being desirous of a speedy settlement he did not think that time had arrived.

As to the Spahlinger treatment, he was told that a movement was going on to raise a sum of money privately which if successful —as he had some reason to hope it might be—would enable M. Spahlinger to produce his remedies in sufficient quantity to be available for experiment, and he would send a supply of these materials over here, where they would be handed over to the Ministry for complete examination. Dr. Dreyer's method, as to which very much more complete information was available, was extremely encouraging. No kind of remedy which offered a reasonable chance of success should be neglected.

Replying to inquiries about the grading of milk, Mr. Chamberlain said he had not yet got returns from the local authorities enabling him to give figures, but he had every reason to believe that the matter was proceeding satisfactorily.

The vote was agreed to.

Scottish Board of Health.

ON a vote for £1,773,730 for the Scottish Board of Health, to follow a vote of £720,000 already given on account, Captain Elliot, on June 27th, made the annual review of administration. He went with some detail into statistics of tuberculosis, infant mortality, and health insurance to ascertain how far trade depression had affected health. The average death rate from tuberculosis (all forms) in 1910–14 was 172 per 100,000; in 1921 it dropped to 118; and in 1922 it was 119. For England and Wales, for the corresponding period, the rates were 140, 113, and 112. From phthisis the average death rate for 1910–14 was 111, and in England and Wales 102. In 1921 the rate was 81 in Scotland and 88 in England and Wales. In 1922 the rate in Scotland had increased to 83 and for England and Wales to 89. It was most encouraging that, speaking broadly, the lower death rate had been maintained in spite of the great trade depression. In 1918 the rate in Budapest was 611, in Warsaw 591, in Lodz 775, in Jugo-Slavia 400 to 500, and in Czecho-Slovakia 386, as compared with 160 in Scotland and 169 in England and Wales. Captain Elliot then gave a number of comparative figures as to infant mortality. The suggestion had been made that the limitation of grants for child welfare had brought about an increased death rate. In point of fact the rate had fallen. The rate per 1,000 births for 1870–80 was, in Scotland 123 and in England and Wales 149. For the period 1911–15 the figures were 113 for the former and 110 for the latter. In 1920–21–22 the figures for Scotland were respectively 92, 90, 101, and for England and Wales, 80, 83, and 77. In the first quarter of last year the rate was 141 for Scotland. That was when maternity, milk, and food grants were given. In the corresponding quarter of this year the figure was 98. It was true that epidemics of measles and influenza had much to do with this high rate, but the fact remained that the figures were higher in the quarter while the grants operated than in the three quarters when they did not. The policy of dissociating maternal care and child welfare from relief agency work had not been seriously challenged by any responsible authority. As regards health insurance, Captain Elliot said that the expenditure per week per insured person was 2d. in 1913 and 2¼d. in 1914; the expenditure for males on sickness benefits was less than 2¼d. in 1920 and less than 2⅜d. in 1921. It was an increase, but balanced by a big increase in the percentage of benefits. The Ministry had been able to pay 50 per cent. of the grant for tuberculosis to the local authorities as promised. The average weekly cost for institutional maintenance in all Scotland, excluding loan charges, was 49s. The estimated cost of the middle ward in Glasgow was 71s. a week. The figures for Glasgow for tuberculous patients treated in fever hospitals was 57s. per week, and the corresponding Mid-Lanark rate was 46s., as compared with the Edinburgh figure of 37s., the Dundee figure of 36s., and Aberdeen 38s. Some further scrutiny of these figures was needed. Captain Elliot said there had been interesting conferences on venereal diseases with the local authorities which are dealing with venereal diseases. There was a widespread feeling that further powers of compulsion should be given to the authorities. Compulsory notification and compulsory treatment were both urged, but the subject involved questions beyond his immediate scope. It was hoped that a report of the death rate amongst mothers, prepared by a strongly representative committee, would soon be available.

Mr. Sullivan moved a reduction of the vote by £10, mainly to condemn the lessening of the welfare grant.

Dr. Chapple rejoiced that, despite unemployment, the mortality from tuberculosis had been going down. He also thought that the figures as to infant mortality for the last ten years were satisfactory. He deplored, however, that the local authorities were continually confronted with the problem of waiting lists for the sanatoriums. These institutions had two functions—curative or for isolation. And he deeply regretted that people should be left in the last stages in the slums of the great cities, where families lived together and where so much harm might occur through infection. He appealed to the Government to spare nothing to remove the causal conditions of disease that existed to-day.

Mr. Maxton, on behalf of the Labour party, spoke bitterly of the higher rates for tuberculosis in Scotland as compared with England. He then referred to the decision that the arrangements for emergency supplies of food and milk to nursing mothers and infants on a large scale must be regarded simply as measures for the relief of distress and withdrawn from association with maternity service and child welfare schemes. He went over the statistics of infant mortality to show that, in consequence of the change, there had been an increase in the death rate from 90.3 to 101.4 per 1,000.

Captain Elliot, interposing, said he had already pointed out that the majority of the deaths took place in the quarter when the policy of relief grants still operated.

Mr. Maxton, continuing, claimed to be using the figures with moderation, his point being that the Minister ought not to be satisfied with them. At the time that the epidemics of measles, influenza, and whooping-cough were raging a circular was issued by the Board saying it could no longer approve of the provision of hospital accommodation for children suffering from whooping-cough and measles. He called the men who initiated that policy murderers, and those who walked into the Lobby in support of it also murderers.

While Mr. Maxton was developing this accusation in hectic language Sir Frederick Banbury raised a point of order, and there followed a scene which has been described in the daily press. Mr. Maxton and Mr. Wheatley, in spite of appeal from the Deputy Chairman, from Mr. Bridgeman, and indirectly from their own leader, Mr. Ramsay Macdonald, persisted in repeating the unparliamentary phrase, and in the end they were reported to the Speaker and a motion for their suspension carried. Two other members, Mr. Stephen and Mr. Buchanan, were afterwards suspended for persistently disregarding the authority of the Chair.

Other Labour members afterwards pursued the debate more moderately. Mr. Macpherson, coming later, paid tribute to the services of the Board of Health in connexion with the Islands and the Highlands, and to the work done by the nursing service. He

asked Captain Elliot, however, to consider whether more could not be done for the isolated communities, and especially for the districts without telephonic or railway facilities. Captain Elliot, replying on the discussion, said the actual fact was that infantile mortality was much lower now than in pre-war years. He welcomed Mr. Macpherson's tribute to the doctors and the nurses in the remoter Highlands, and read as an example of the services of the nurses a report from a medical officer dealing with a recent epidemic of typhus, wherein he spoke in the highest praise of the assistance rendered by a nurse under the most trying conditions.

The amendment was rejected by 209 votes to 118, and the vote was agreed to.

Bequests to Hospitals.—Viscount Ednam, on report of the Finance Bill, moved a clause to provide that legacy and succession duty should not be leviable on bequests to public hospitals. He repeated the case presented by a very influential deputation to the Secretary of the Treasury in the previous week. He recalled that Lord Cave's Commission advised a grant of £1,000,000 (of which the Treasury had seen its way to give only half), and had advised that testamentary gifts to hospitals should be exempt from legacy duty, as in the United States. He pointed out that there was no difficulty in discriminating between voluntary hospitals and other charities, and reckoned that the sum involved for the Treasury would not exceed £130,000. Major Cadogan seconded the motion and Dr. Macnamara warmly supported it, mentioning that six wards (180 beds) at King's College Hospital, Denmark Hill, were closed, and there were 1,000 persons on the waiting list. Sir William Joynson-Hicks, in stating that the Government did not see its way to accede to this request, insisted that it was not unfriendly in holding that it was better for the hospitals to ask for an open rather than a concealed subsidy. He argued that if a man left, say, £1,000 to a hospital and the rest of his fortune to his wife and family, it would be the widow and family that would benefit, and not the hospital, from the repeal of this clause. If the House concluded that under the voluntary system the hospitals were on the verge of breaking down, the Government would be bound to give a subsidy. He held that there would be difficulty in drawing the line between hospitals and other charitable institutions. His information also was that on the average the loss to the State by the suggested change would be about £200,000 a year. Mr. Charles Roberts, Colonel Sir Charles Burn, Mr. G. Spencer, Colonel M. Alexander, Sir W. Lane-Mitchell, and Dr. Chapple pressed for a reconsideration of the matter. Viscount Curzon, on the other hand, agreed with the Minister. The Solicitor-General (Sir W. T. Inskip) made further reply. Viscount Ednam said that the hospital authorities, for whom he spoke, did not wish to divide the House against the Government. He was bound, however, to say that they were very greatly disappointed at the unsympathetic attitude of the Government. Leave to withdraw the motion was refused, Labour members more especially calling for a division. The proposed clause was thus rejected by 243 votes to 153. Viscount Ednam and some other Conservatives who had spoken in favour of the clause did not vote.

Insurance Medical Service.—Lord E. Percy stated, on June 27th, in answer to Sir Kingsley Wood, that the Insurance Acts Committee had met representatives of the Ministry of Health on the previous day to discuss recommendations of the Panel Conference as to the revision of the terms of service. Further discussion would be necessary on certain points with the Insurance Consultative Council. No joint conference beween representatives of the insurance practitioners and approved societies and the Minister, as was suggested by Sir Kingsley Wood, was contemplated at present, and it was unlikely that any definite decision as to the rates of remuneration would be reached before the autumn. Any change in the terms of service of insurance practitioners, apart from the amount of the practitioner's remuneration, would involve an amendment of the regulations, and any amending regulation would be laid before Parliament in accordance with the terms of the Act of 1911.

Cancer Research.—In reply to Mr. Becker, on June 27th, Lord E. Percy stated that roughly one-third of the annual grant of £130,000 to the Medical Research Council was allocated by that body to the payment of the research staff and the maintenance of the central laboratories at the National Institute of Medical Research. The remainder was distributed in grants in aid of research work carried out by universities, hospitals, and other centres throughout the country. In addition to the sum of £5,000 expended in grants for work directly upon cancer, radium owned by the Government to the value of £70,000 was made available by the Council for approved research into the treatment of cancer. The problem of cancer might be solved sooner and perhaps only through advancing in fields of medical science other than the direct study of the disease itself, and accordingly advances in the knowledge of cancer were effectively promoted by the grants for research in the primary parts of medical science. The allocation for cancer varied from year to year as the Council found useful opportunities for supplementing the work done by the Imperial Cancer Research Fund and other institutions devoted especially to the subject. Major Molloy asked whether Lord Percy was aware that the death rate from cancer had increased during the last forty years by 126 per cent.; and Sir Sydney Russell-Wells suggested that more money might be devoted to dealing with this appalling scourge. Lord E. Percy said he would be glad to receive suggestions.

Cancer Mortality.—At the instance of Major Molloy, on June 27th, who asked for information as to the proportion of cancer deaths in decades amongst persons of 30 years of age and upwards, Mr. Chamberlain said that full particulars were not available, but gave the following percentages of total deaths:

Age 35 years and over:	
1881–1891	6.6
1891–1900	8.5
1901–1910	10.9
1911–1920	12.4
1921	15.3
Age 30 years and over:	
1911–1920	12.3
1921	14.9

Mr. Chamberlain stated, on July 2nd, in reply to Commander Locker-Lampson, that he was giving attention to the increasing prevalence of and mortality from cancer and the action which central or local public health authorities might be able to take for investigation and cure. He did not consider, however, that the establishment in every area of special machinery financed out of the local rates would be desirable.

Pitch Cancer.—In reply to Mr. D. Williams, on June 28th, the Home Secretary said that the numbers of men engaged in the manufacture of pitch and patent fuel reported to the Factory Department as suffering from "pitch cancer" in the last five years were as follows: In 1918, 23; in 1919, 10; in 1920, 25; in 1921, 18; and in 1922, 15. No fatal cases were reported in 1918 to 1920; two were reported in 1921 and one in 1922. Before 1920 the disease was not compulsorily notifiable under the Factory Act, but cases were notified under a voluntary arrangement. The figures did not indicate any increase in incidence. No information was available to show the number of deaths in these industries from other forms of cancer. Mechanical appliances were generally used where practicable, but this could be done only in a few operations. The most effective precautions were great attention to personal cleanliness and periodic medical examination. Facilities to enable the worker to take these precautions had been arranged at the instance of the Factory Department in all the works concerned.

Alleged Infection from Returned Bread.—The Marquess of Titchfield asked, on June 13th, whether there was a practice common among the vendors of bread of accepting from customers unused bread in exchange for fresh loaves; whether such practice provided a means of spreading infection, and if the Minister of Health would introduce legislation to make it illegal. Mr. Chamberlain said he was not aware of the extent to which this course was adopted or of any case of the spread of disease through it, but he would be glad to receive particulars.

Answers in Brief.

The ratio of vaccinations or revaccinations performed on British soldiers in 1921 was 250.10 per 1,000 strength.

The residential institutions in England approved by the Ministry of Health for the treatment of tuberculosis contain about 19,730 beds and those in Wales 1,315.

England and Wales.

University of Durham.

On June 26th, at a crowded convocation of the University of Durham, the honorary degree of D.C.L. was conferred on Sir Anthony Bowlby, Bt., President of the Royal College of Surgeons of England, and Consulting Surgeon to St. Bartholomew's Hospital. On the previous evening he was the principal guest at the annual dinner of the University of Durham Medical Graduates' Association, held in the King's Hall of the Armstrong College. The company, which numbered over one hundred ladies and gentlemen, was received by the President of the Association, Mr. Leech, and by Mrs. Leech.

The guests included the Vice-Chancellor of the University (Professor A. Robinson), Sir David Drummond, Sir Theodore Morrison, Dr. Cecil Cochrane, and Professor Howden.

After the Royal toast had been honoured, Dr. R. A. Bolam proposed the toast of The Guests. As this was only the second banquet at which ladies had been present, a delicate compliment was paid to them. Of each guest some kindly remark was made and appreciated by the gathering, but it was only proper that Dr. Bolam should reserve the main part of his speech for the principal guest of the evening. There was, he said, a peculiar appropriateness in the Durham Graduates' Association seeking to do honour to Sir Anthony Bowlby, for he was a north countryman, having spent the early years of his life in the City of Durham. The medical profession on Tyneside extended a hearty welcome to him, for, whatever was his love for the North, Sir Anthony was recognized as an extremely

capable and skilful surgeon, as an author, and as a successful teacher. He came of a fighting stock; several of his forbears had fought at Waterloo. He himself had first given surgical service during the South African campaign. In the recent war, both as an operator and an administrator, he had been of the greatest assistance to the army and his country. It was common knowledge that many young medical men who had gone to the front found themselves placed in circumstances where they had no opportunity of utilizing the knowledge and experience they possessed. Sir Anthony Bowlby had righted things for many of these men, and thus, in return, got out of them the best work possible. The country generally was grateful to Sir Anthony Bowlby for all that he had done. The toast was most heartily received. In his reply, Sir Anthony alluded at considerable length to his association when at the front with the Northumbrian Division. He paid a high compliment to the fighting spirit and bravery of the men of the North, particularly to what they had done on April 27th, 1915, when the enemy, near St. Julien, launched his first gas attack. He spoke of the great services rendered by the surgeons of the North of England, especially of those of Mr. John Clay. At Hazebrouck there remained the kindliest of memories of the surgeons from the North of England. The excellent work done by Mr. Hamilton Drummond was specially alluded to, while to Dr. Horsley Drummond an equally well-deserved compliment was extended. Dovetailing between his serious remarks a short humorous story now and then, Sir Anthony's reply was most favourably received. To Sir Theodore Morrison was entrusted the toast of the Medical Graduates' Association. He pleaded for making the North of England a "resistance centre." There was too great a tendency to regard London as the one place where the best work of the country was done and that thither all the best brains went. He maintained that there were just as capable men in the provinces and as many of them as in the metropolis. The President, Mr. Joseph Leech, replied; after mentioning that the association was founded in 1880, he expressed the hope that more graduates would feel it their duty to become members of it. The pleasure of the evening was enhanced by music and song.

Treatment of Tuberculosis in London.

The Public Health Committee presented a report to the last meeting of the London County Council on the tuberculosis dispensary service and the work of tuberculosis care committees. At a recent conference between representatives of the Council, of the City Corporation, and of the borough councils it was resolved to draw the attention of the London Panel Committee and the British Medical Association to the desirability of securing earlier notification of cases of tuberculosis. The letter received from the County Council is printed on page 43. The borough councils which provide hospital dispensaries and the borough councils concerned in cases in which there is lack of co-ordination between the borough public health department and the municipal dispensary are to be urged to take steps to secure closer co-operation between the department and the dispensary. A proposal that facilities should be provided for the post-graduate instruction of tuberculosis officers was favourably received by the conference of local authorities, and the Public Health Committee has since been in communication with the Ministry as to the practicability of an expenditure not exceeding £1,000 for this purpose during the current financial year ranking for Government grant. The Ministry has intimated that it will be prepared to give an approval carrying a grant to satisfactory proposals from metropolitan borough councils within this limit of expenditure. The Public Health Committee is now in consultation with the Ministry of Health as to the nature of the arrangements which can best be made.

Small-pox in Gloucester.

The situation at Gloucester, where there is an outbreak of small-pox, remains serious, but it is being dealt with efficiently and firmly. Down to July 3rd, 191 cases of small-pox had been admitted to the Brockworth Isolation Hospital, near Gloucester. Dr. W. H. Davison, assistant medical officer of health for Birmingham, has been given a free hand by the Gloucester City Council to take all measures he considers necessary. He is being assisted by two medical men with wide experience of small-pox, who have been lent by the Metropolitan Asylums Board. Some of the difficulties with which Dr. Davison has had to grapple may be realized from a report, in the *Birmingham Post* of June 28th, of a meeting of the Gloucester City Council on the previous day. It was stated that the matron of the isolation hospital had resigned and proposed to leave at once. Captain J. Wood, chairman of the Public Health Committee, in moving the adoption of the minutes, referred to an article in which Dr. Hadwen had said, "I do not believe that there is a single case of small-pox in Gloucester." The Health Committee had evidence that absolutely disproved Dr. Hadwen's statement. The article also assailed the professional qualifications of Dr. Davison, whose services had been of the greatest value. Dr. Killick Millard, medical officer of health of Leicester, had seen the cases and confirmed Dr. Davison's diagnosis of small-pox. Dr. Millard said, "Every case I have seen is a case of small-pox." Captain Wood asked him if he had seen a single case of chicken-pox in the hospital, and Dr. Millard's reply was, "No, not one; nor can I understand how any medical officer can say these are not cases of small-pox." A letter had been sent to the public vaccinator from a Gloucester father, in which he said that out of eight children in his home, two had been vaccinated, and they had not a blemish on them, but the other six were suffering from the disease. Mr. J. W. Embling gave his views on the diagnosis of small-pox, quoted Dr. Hadwen's opinion, and questioned Dr. Davison's competence, whereupon, after some further discussion, during which it was stated that Dr. Davison had been insulted in the street and threatened with personal violence, the Council unanimously passed a resolution tendering its warmest thanks to Dr. Davison for his valuable services, and, having the fullest confidence in his qualifications and administrative ability, urgently asked him to continue his services in Gloucester. After the meeting a deputation, which included the Mayor, the chairman of the Health Committee, and Mr. Embling, presented the resolution to Dr. Davison, who said that he could not disregard it and would continue to serve Gloucester for the period for which he had come. Dr. J. R. Bibby resigned, on June 30th, his position as medical officer of health for the city of Gloucester. It is understood that he intends to seek election, when opportunity occurs, to the Gloucester City Council, of which he was formerly a member. He was appointed medical officer of health for Gloucester in 1919.

A letter from Dr. Headlam, Bishop of Gloucester, was read in Gloucester Cathedral and in the churches throughout the city, on Sunday, July 1st.

So far, the Bishop wrote, the cases of small-pox had not been very serious, but in the great epidemic of twenty-seven years ago all the cases were at first mild, but later the deaths were appalling. He definitely declared the cause of the outbreak to be the neglect or refusal to be vaccinated. To refuse to be vaccinated was, he believed, wrong from a religious point of view. God had given them intellectual powers which enabled them to study the working of nature, and to learn the laws of nature. To refuse to obey His laws, to refuse to make use of the more certain results of medical science, and then to pray that they might have good health, was as wrong and foolish as it would be for a farmer to pray for good crops and refuse to cultivate the ground. Unless they could shake off the appeals to low motives, to party prejudice, to class prejudice, they could not hope to make the state of their city better.

During the week ending June 23rd, 1923, a total of 141 cases of small-pox were notified in England and Wales, according to the official *Weekly Return of Births, Deaths*, etc., issued by the Registrar-General. The notifications were made up as follows:—Derbyshire—Alfreton, 1; Belper, 1; Heanor, 4; Long Eaton, 5; Clowne, 1. Durham: Stockton-on-Tees, 1. Gloucestershire: Gloucester (county borough), 79; Gloucester (rural district), 3; Cheltenham, 1; Stroud, 2; Westbury, 1; East Dean, 4. Hereford: Hereford (borough), 1. Notts: Kirkby-in-Ashfield, 6; Warsop, 15. Worcestershire: Martley, 1. Yorkshire: Middlesbrough, 1; Bentley, 2; Doncaster (rural district), 10. Monmouth: Risca, 1.

Scotland.

Dinner to Sir Henry Gray.

Sir Henry M. W. Gray was entertained at a complimentary dinner by his friends of the medical profession on June 27th, in the Palace Hotel, Aberdeen, on the occasion of his leaving Aberdeen to take up his new post of chief of the surgical staff of the Royal Victoria Hospital, Montreal. Mr. J. Scott Riddell presided over a company of a hundred. In proposing the health of the guest, Mr. Scott Riddell said that he had watched Sir Henry Gray's surgical career since he was a medical student, and in every position he had held three admirable qualities had been present—an infinite capacity for work, a painstaking care in all he did, and an abounding and infectious enthusiasm in the practice and advance of surgery. Sir Henry Gray was the second apostle in surgery that Aberdeen had sent across the Atlantic, for his old friend John Fairbairn Binnie had already made himself and Aberdeen famous there. Sir Henry Gray went as a disciple of Alexander Ogston, that inspiring surgeon who founded the modern school of surgery in Aberdeen. It had required persistent and painstaking effort to keep the surgical school thoroughly up to date, and in this work of progress their guest had borne his full share. During the war Sir Henry Gray had quickly risen to the rank of colonel and surgical consultant to a British army in the field, and he came back to his native city bearing the insignia of many famous orders. He was going to work in a city three times the size of Aberdeen, with a university many of whose benefactions had come from men of Scottish birth. Montreal was a centre which should provide great opportunities for such an ardent surgeon. Their guest would never forget the city that had given him birth, the medical school that trained him, and the colleagues with whom he worked for so many years, while on their side there would remain a deep sense of personal loss tinctured by a feeling of pride that one of themselves should be hailed abroad to spread the light and enhance the reputation of the medical school of Aberdeen. Sir Henry Gray, in reply, said that the gathering took him back to the time when he completed his house-surgeonship with his great chief, Sir Alexander Ogston. He regretted very much that illness had prevented Sir Alexander from being there, for he should have liked to have acknowledged to him personally, before them all, the great debt he owed him for the inspiration, stimulus, encouragement, and many kindnesses he had received at his hands. He had tried to do his work faithfully in their midst, and to advance surgical interest to the best of his ability. He wished also to acknowledge his great indebtedness to the members of the nursing profession in the North who had helped him. Dr. Thomas Fraser proposed the health of the other guests, and Mr. J. W. Dowden and Mr. F. MacRae replied; the proceedings concluded by Professor Marnoch proposing the health of the chairman, which was acknowledged by Mr. Scott Riddell.

Gibson Memorial Lectures in Edinburgh.

The George Alexander Gibson Memorial Lecture, given in the Royal College of Physicians at Edinburgh every second year, was delivered on June 27th and 28th by Dr. W. T. Ritchie. He took for his subject, "The Response of the Heart in Health and Disease." On the first day the lecture was devoted mainly to a consideration of the origin and transmission of the cardiac stimulus in normal circumstances, a description of the nodes and neuro-muscular system of the heart, and the properties of cardiac muscle fibres. The electro-cardiographic response was demonstrated by lantern slides of electro-cardiograms, which showed the manner in which the normal cardiac response might be modified by nervous influences, mechanical factors, and metabolic processes. On the second day the lecturer described types of cardiac response rendered abnormal by disease situated in different parts of the heart, or by the action of drugs. There were two great disease factors operative in the production of heart disorders—rheumatism, which produced its effect chiefly in the decade 20 to 29, and syphilis in the two decades 40 to 59. Sino-auricular block was seldom produced, and its effect could be abolished by atropine. Auriculo-ventricular block was frequently produced by a ring of calcareous deposit round the base of the mitral valve, which pressed upon the bundle of His; the result was that while the auricle contracted with unabated frequency, the ventricle failed to respond to many of the auricular contractions, and its rate was therefore slowed. The ventricular contraction was at the same time lengthened from the normal duration of 0.32 second to 0.4 or 0.5 second. One of the effects of this was an increase of the difference between the systolic and diastolic blood pressures, which might result in a defect of oxygen supply to the central nervous system and consequent syncope. These symptoms were generally known as the Stokes-Adams syndrome, but it was interesting to note that they had been described along with the morbid anatomy by Morgagni as long ago as 1762. Extra-systole was a very common condition, and might start in any part of the heart. When it originated in the auriculo-ventricular node the electro-cardiogram showed an inverted auricular wave. It was most apt to occur when infection was spreading from endocarditis of the mitral valve to the wall of the ventricle, thus causing irritation of the auriculo-ventricular node. Auricular flutter was shown by a very rapid contraction rate of the auricles. Auricular fibrillation was extremely common, its maximum incidence in females occuring in the decade 40 to 49, and in males ten years later. *X*-ray examination of the heart in this condition generally revealed a distinctive globular appearance of the heart shadow, the auricles often showing a prominent bulge on either side. In the electro-cardiogram the absence of the auricular wave was to be noted. As to the pathological basis of this condition, Lewis had demonstrated that it arose from shortening of the refractory phase; and on histological examination the muscle of the auricle sometimes showed inflammatory signs, though not always. With regard to drugs, digitalis acted through its influence on the vagus or on the neuro-muscular tissues. Quinidine had been introduced in 1918 and operated through lowering conductivity. Its use was not devoid of danger; it was most effective in fibrillation of recent origin, and had little influence on old-standing cases.

Cameron Prize Lectures.

The Cameron Prize Lectures of the University of Edinburgh were delivered on June 27th and 28th in the Physiology classroom by Professor F. G. Hopkins, F.R.S. Principal Sir Alfred Ewing occupied the chair at the first lecture, and Professor Cushny at the second. The lecturer discussed the present position of the vitamin question, and pointed out that at the close of the nineteenth century physiologists had regarded foodstuffs simply from the point of view of their isodynamic equivalent. In the last few years, however, the importance of the qualitative factor in food had been more fully recognized. Food must contain certain exogenous hormones, to which the name of vitamins was given; an animal would die if provided with a diet containing only pure fat, protein, and carbohydrate. The amount of accessory factors necessary was extremely small. For example, two sets of ten rats had been kept on a diet which was ample as regards energy-producing power; to the diet of one set had been added 5 mg. of cod-liver oil, containing an extremely minute amount of accessory factor; it had, however, been sufficient to make the difference between the life of one set of rats and the death of the other set in 70 days. Probably the amount of cod-liver oil administered might have been still smaller. Vitamins were much more stable under the influence of heat than was formerly supposed; their instability was largely a matter of oxidation, for in acid solution they were unaffected by boiling for several hours. Their action was probably exerted by a dynamic process of catalysis. In the second lecture Professor Hopkins dealt specially with researches in regard to vitamin A; its complete absence precluded growth altogether, but the diet could be so adjusted that growth might just take place, with, however, the series of defects known as rickets. Rickets might also result from a want of balance between the amount of calcium salt and of phosphoric acid in the

food. Absence of sunlight had also a great effect in the causation of rickets; experiments had shown that this effect was due to defective actinization of the air breathed by the animals leading to calcium phosphate retention in the tissues of the body.

THE SCOTTISH R.A.M.C. MEMORIAL.

The Scottish part of the war memorial to the 743 officers and 6,130 other ranks of the Royal Army Medical Corps who lost their lives in the great war has just been carried to completion. The memorial in St. Giles's Cathedral, Edinburgh, was unveiled on June 30th by Lieut.-General Sir Walter Braithwaite, Commander-in-Chief, Scottish Command. It consists of a bronze tablet, with an angel of mercy at the top bending over a wounded soldier, and underneath, the crest of the R.A.M.C. The service of dedication was conducted by the Rev. Dr. Wallace Williamson. The memorial in Westminster Abbey was unveiled a year ago.

THE SCOTTISH BOARD OF HEALTH.

We referred briefly last week to the publication of the fourth annual report of the Scottish Board of Health, and indicated that the activities of the Board were to some extent limited during 1922 by the need of economy and by the prolonged trade depression. Employment showed scarcely any improvement as compared with 1921, and the Board found it necessary to extend for another year the operation of the Poor Law (Emergency Provisions) Act, 1921, which authorized parish councils to grant relief to destitute able-bodied unemployed and their families. This involved grants by ninety parishes in Scotland, amounting in all to £1,200,000 during the year.

The death rate for the year was 14.9 per 1,000 of population, which was 1.3 more than that of the previous year, but still 0.3 less than the mean of the rates for the previous ten years. There was a slight rise in the death rate from pulmonary tuberculosis (0.83 per 1,000, compared with 0.81 for 1921). The infant mortality rate was 101.4 per 1,000 births, which was 11.1 per 1,000 higher than in 1921, which, however, was the lowest rate recorded for Scotland. The estimated deaths per 1,000 children over one and under five years of age is 19.9, compared with 12.4 for 1921. The immediate causes of the increase were epidemics of measles, whooping-cough and "influenza" in the first half of the year. These figures bring out the deadly nature of the so-called "childish complaints," but the Board does not consider that it has sufficient data to determine the effect of unemployment upon this.

With regard to venereal diseases there seems to be a definite, if small, falling off in their incidence in Scotland. The infected persons who were treated in 1922 numbered 21,364, of whom 10,688 were still under treatment at the end of the year, and 4,759 were discharged cured. Just under one-half discontinued treatment without the sanction of the medical officer in charge. The treatment of venereal diseases involved an outlay of £65,782.

It is gratifying to note, especially in view of the prevalence of small-pox in some parts of England, that Scotland was practically free from the disease in 1922, only seven cases having been notified, all in the burgh of Kirkcaldy. Small outbreaks of typhus fever occurred during the year in Glasgow, Saltcoats, and the islands of Raasay and Skye.

Regarding shortage of houses, the report states that if the estimates framed by the local authorities in 1919 are accurate, the housing problem in Scotland is still a long way from being solved. Indeed, the shortage is probably accumulating, for it is doubtful whether the number of houses being built each year is sufficient to provide for the natural increase of population and to replace houses that become unfit for occupation. Since there is no alternative accommodation for the occupants of these unfit houses, the local authorities are prevented from exercising their powers to close them. As a result, unfit houses remain occupied, to the detriment of the health and well-being of the occupants. The estimated number of houses required in 1919 was 131,101, and by the end of 1922 only 14,777 had been completed, with a further 10,722 in course of erection. The Board believes that the present shortage in Scotland amounts to at least 100,000 houses. The Board notes an appreciable fall in building costs, so that the private builder has been enabled again to commence work.

EDINBURGH ASSOCIATION FOR SOCIAL STUDY.

The annual meeting of the Edinburgh Association for Social Study and Training was held in the Senate Hall of the University of Edinburgh on June 26th, Principal Sir Alfred Ewing in the chair. In the report for 1922, which was presented by the director, Miss Nora Milnes, special emphasis was laid upon the development of visitation in their homes of out-patients attending the Royal Infirmary. During the past three months 162 cases had been investigated and 280 visits paid. The report was cordially approved on the motion of Sir John Lorne Macleod, G.B.E. Thereafter an address was delivered by Miss Ida M. Cannon, director of Hospital Social Service, Massachusetts Hospital, Boston, United States of America. She said that in addition to the medical and research aspects of the hospital hitherto universally recognized, the hospital had a third and very important social function to discharge. She indicated the lines upon which this was being developed in the United States. Professor Sir Richard Lodge, one of the managers of the Royal Infirmary, in proposing a vote of thanks to Miss Cannon, said that in Edinburgh the social needs of in-patients had for long been well looked after by the Samaritan Society, and at the present time great efforts were being made to develop a social service on the lines indicated for the out-patients.

CENTRAL MIDWIVES BOARD FOR SCOTLAND.

At a meeting of the Central Midwives Board for Scotland for the hearing of penal cases, Dr. James Haig Ferguson in the chair, two nurses were found guilty of negligence and breaches of the rules. The Board instructed the instructing the removal of the name from the midwives' and issued an order that they be prohibited from attending women in childbirth in any other capacity. Another nurse appeared in answer to charges of failure to notify ophthalmia neonatorum in two cases, and other breaches of the rules. The Board found the charges to be proved, and expressed the opinion that the offences could not be adequately dealt with by censure or caution, but before instructing the removal of the name from the midwives' roll and the cancelment of her certificate, and in order to give an opportunity of proving amendment, it was decided to postpone a decision and to put the midwife on probation for report from the local supervising authority, and, in the event of an unfavourable report being received, instructions were given that the name would forthwith be removed from the roll and the certificate cancelled.

Ireland.

THE annual meeting of the Royal Medical Benevolent Fund Society of Ireland was held on June 20th, in the Royal College of Physicians, Dublin, when 76 cases were considered, and the sum of £1,462 was voted to 72 applicants.

IRISH COMMITTEE.

A meeting of the Irish Committee of the Association was held at the Irish Offices, 16, South Frederick Street, Dublin, on Wednesday, June 20th. Dr. Denis Walshe, chairman, presided and there were present: Dr. Joseph Power, Dr. J. Singleton Darling, Dr. H. T. Warnock, Dr. John Mills, Dr. T. B. Costello, Dr. R. C. Peacocke, and Dr. T. Hennessy, Irish Medical Secretary. Apologies for absence were received from Sir James Craig, M.D., T.D., Dr. H. Corby, Mr. R. J. Johnstone, F.R.C.S., and Dr. P. G. Lee.

Dr. William Murphy, Dr. Joseph Power, and Dr. H. T. Warnock were co-opted members of the Committee. Dr. Denis Walshe was re-elected chairman, and Dr. John Mills

vice-chairman: Sir James Craig, Dr. J. S. Darling, Dr. W. Doolin, and Dr. R. C. Peacocke were elected members of the Finance and Executive Subcommittee.

Vote of Thanks to Sir James Craig, M.D.

Several members of the Committee and the Irish Medical Secretary referred to the great services rendered by Sir James Craig, M.D., to the furtherance of Irish public health and the interest of the profession generally since his election to the Dail as one of the members for Dublin University. The Irish Medical Secretary was directed to write to Sir James thanking him, on behalf of the Irish Committee, for his services in the Dail in connexion with medical questions.

British Medical Association in Ireland.

The position of the Association in Ireland was considered in connexion with the different changes in the government of Ireland. The Committee was glad to notice that the change in Irish government seemed to make no difference in regard to the position of the British Medical Association in Ireland, and that the Association was functioning as heretofore throughout the country.

Medico-Political.

The Committee considered the agenda of the Irish Medical Committee, and it was agreed to adopt and further the decisions of the Irish Medical Committee arrived at in accordance with the resolutions of the last meeting of delegates, representative of the entire Irish profession. The Committee also decided that the Irish Medical Secretary (Dr. T. Hennessy) should continue to act as honorary medical secretary of the Irish Medical Committee.

Correspondence.

"DIAPLYTE" VACCINES AND ANTIGENS.

SIR,—In my paper[1] published in the last number of the *British Journal of Experimental Pathology* I gave an account of a method of preparing antigens from *B. tuberculosis* and some other Gram-positive bacteria, and I provisionally described the bacterial antigen so prepared as "defatted," a word that had been used conversationally in my laboratory. I pointed out at the same time that by the term "defatted" it was by no means intended to imply that all fatty or lipoidal substances present in the micro-organisms so treated had been removed. Only some of the lipoidal substances are taken away in this mode of preparation by washing with acetone after formalin treatment.

It is plainly desirable, however, that the term "defatted" should not come into general use. It is as false, I am afraid, to the laws of language as it is to the experimental facts. I propose to introduce a new word to describe the vaccines or antigens prepared by this or similar methods of extraction. The essential factors in the process are the fixation treatment by formalin and the successful acetone extraction which the fixation permits. The bacteria so treated become, as I have described, non-acid-fast and Gram-negative, and are changed in appearance. They have been thoroughly washed out, and I propose to call them "diaplytes," from the Greek word πλυτός, washed, in its intensive form διαπλίτος, washed through and through. I propose to speak of "diaplyte vaccines" or "diaplyte antigens," and in the process of their preparation I should describe the acetone used as being the "diaplytic agent." I think there is justification for introducing a new word for the description of these vaccines, and it seems desirable to use one which has no previous connotations in pathology.—I am, etc.,

GEORGES DREYER.

Department of Pathology,
University of Oxford, July 3rd.

[1] Some New Principles in Bacterial Immunity, their Experimental Foundation, and their Application to the Treatment of Refractory Infections. *Brit. Journ. Exper. Pathol.*, 1923, 4, 146.

EARLIER NOTIFICATION OF TUBERCULOSIS.

SIR,—At a recent conference between the members of the Public Health Committee of the Council and representatives of the metropolitan borough councils, the question of the earlier notification of tuberculosis was considered. The conference passed a resolution as follows:

> That this conference is of opinion that the attention of the London Panel Committee and the British Medical Association should be called to the desirability of securing earlier notification of cases of tuberculosis, and that such information as is available should be forwarded to them.

Ministry of Health circular No. 194 (April 4th, 1921) suggested that, in order to secure prompt notification of cases under the Public Health (Tuberculosis) Regulations, 1912, metropolitan borough councils should once more direct the attention of the medical practitioners practising in their areas to the importance of strict compliance with their obligations under Article V of the regulations.

Attention has more recently been drawn to the failure on the part of medical practitioners to notify cases of tuberculosis. Under the Public Health Act, 1896, penalties are recoverable for wilful neglect or refusal to carry out the Tuberculosis Regulations; but after a long discussion of the matter at the conference, it was not considered that prosecutions would be the most hopeful means for increasing the proportion of early notifications.

The Council concurs in the resolution of the conference, and I am directed to communicate accordingly with the London Panel Committee and the British Medical Association, and to furnish to them the following summary of information obtained from the medical officers of health of the metropolitan boroughs:

Total number of deaths from tuberculosis.	No. dying unnotified or notified at death.	Notified within one month of death.	Notified within three months of death.	Notified within six months of death.
During 1920: 5,086...	1,496 (29 %)	589 (11 %)	474 (9 %)	357 (7 %)
During 1921: 5,222...	1,637 (31 %)	674 (12 %)	571 (10 %)	504 (9 %)

In addition, I am to invite the London Panel Committee and the British Medical Association to direct the attention of their members to the fact that the services of the tuberculosis officers are available for consultation and for the examination of contacts, and that the Council has provided observation beds for the purpose of diagnosis.—I am, etc.,

MONTAGU H. COX,
Deputy Clerk, L.C.C.

The County Hall, Westminster Bridge, S.E.1, June 21st.

ETHER *VERSUS* CHLOROFORM.

SIR,—It is a matter for congratulations that you have opened your columns to a discussion upon this subject, which, though treated in a somewhat academical fashion by some medical men, is of vital interest to the public. In the course of argument with my house-surgeons I have frequently been astounded by the remark, "Well, I have given some hundreds of anaesthetics, and I have *only had one death* from chloroform." One death! Only one family left without the breadwinner, only one woman deprived of her only child, only one husband left to mourn the loss of his wife! Oh, the tragedy of it! Year succeeds year and chloroform takes its toll of the population, and yet nothing is done to stop it.

My own experience of chloroform has convinced me that it is in any dilution a deadly drug, and that no previous examination, however stringent, can detect that unfortunate patient who has an idiosyncrasy regarding chloroform.

My first introduction to its danger was when a student at St. Bartholomew's Hospital. A youngish man was given chloroform by one of the staff anaesthetists to allow a catheter to be passed. The drug was administered drop by drop upon a flap of lint with ample air. Before a drachm had been given the patient turned white and was dead. There was nothing to be done; the heart had ceased to beat.

Shortly afterwards two children died during induction with chloroform given for adenoid operations.

For the past sixteen years I have been on the staff of two general hospitals. In one chloroform is frequently used and there have been several deaths, mostly during induction. There was one death under ether, but this was a case of frontal sinus disease in an old decrepit man and a lot of blood was aspirated into his lungs. At the other general hospital ether is given. There has been one tragedy in ten years. A young, perfectly healthy girl was given chloroform to undergo a trivial operation. She died during induction. At the special hospital to which I am attached there has been one death in ten years, again chloroform. At the British Ophthalmic Hospital, Jerusalem, we used ether almost exclusively, given by an Arab boy educated in a mission school. We often performed twenty operations a day under ether, and I cannot remember a case that gave the slightest anxiety during the four years I worked there.

For the past sixteen years I have never employed chloroform, and I have extracted five cataracts under ether. I submit that if ether is suitable for cataract extraction, which demands absolute relaxation of the superior rectus, it will do for most operations. I absolutely forbid my house-surgeons to use chloroform in any dilution whatever without my permission—permission which I should never give unless the patient was one of those rare persons who cannot breathe ether. I tried the method advocated by Silk and McCardie: a mixture of one part of chloroform to sixteen of ether administered in a Clover apparatus. I very nearly had a fatality in the case of a young, perfectly healthy boy. We had to perform artificial respiration for twenty minutes.

The advantage of ether is that it is perfectly safe, I believe safer even than gas, and that it can be given by the semi-skilled. In Jerusalem we had an Arab boy, and he did all that was necessary. In America ether is given by a nurse. It can be administered without any apparatus, but I prefer to induce with a Clover, and to put 3 c.cm. of ethyl chloride into the bag. Unconsciousness supervenes in two or three minutes, and then we change to open ether. The alpha and omega of ether administration is to keep the jaw forward, and to give as little of the drug as possible.

My own experience is that ether is perfectly safe, and that chloroform is deadly. The constant records of deaths under chloroform confirm my view, and I think that the time has come when the Legislature should lay down stringent regulations regarding the administration of chloroform.—I am, etc.,

Leamington Spa, June 30th. T. HARRISON BUTLER.

SIR,—There is no question that the periodical discussion on the respective merits or otherwise of chloroform and ether does help, by the pouring out for the anaesthetist's benefit the full vintage of the experience of many operators.

The advocates of each rather claim an anaesthetic Utopia for their favourite, and incidentally criticize the one they depreciate. Their praises of the merit of one is at the same time an indictment of the other. In spite of the lurid tones in which some depict chloroform, and though I also like ethanesal, I venture to support Dr. Samways in his appreciation of chloroform.

All surgeons, I believe, appreciate the quietness and relaxation that chloroform gives. Still, as Mr. Tilley remarks, the first and chief object is the safety of the patient. His experience seems to forge link to link to a chain in a way that rather prevents the remark that the chain has nothing to hold it. In fact, Mr. Tilley has conjured up the dread spectre of sudden death to scare the anaesthetist and drive him to ether.

I have heard that bronchitis and pulmonary sequelae do sometimes occur with ether; with chloroform such is not the case, I believe. Some patients, I am told, have died from post-ether pneumonia. These, of course, are not the subject of a coroner's investigation and so do not cast a slur on ether by being reported in the press. We may as well be candid and also, if possible, impartial.

Do I rub the sore when I should bring the plaster? I use and like both of these anaesthetics. Still, I would suggest that with a gradual induction, such as can be obtained with a percentage inhaler, the dread spectre of sudden death can be exorcised.

For cerebellar operations, and all those in which the respiratory centre may be interfered with, and sepsis, where acidosis may be feared, chloroform is, I admit, not suitable. Still, there are shoals of other operations, and chloroform is a good net for many fish, and, with care, I venture to state none should escape without the requirements of the operator being fulfilled with absolute safety. Of course, the administrator must pay attention to his work and not monkey with the steering wheel over such a precipice as anaesthesia. If that is seen to I am sure the conclusion will be that chloroform cannot be slighted with impunity.—I am, etc.,

London, S.W., July 1st. CHARLES T. W. HIRSCH.

SIR,—One afternoon, thirty and more years ago, I was sitting in the lowest tier of seats in the operating theatre of King's College Hospital watching the late Lord Lister tapping down the ends of the silver wire with which he was uniting the fragments of a fractured patella (then a new operation) rendered possible by his own faith in his new treatment of wounds.

His house-surgeon (*pro tem.*) was a recently qualified student who was giving chloroform. He had a white square of surgical lint, which he held pressed lightly over the patient's nostrils and opening of his mouth. Some remark caused Lister to look quickly at the patient, whose face had a waxy look, and who appeared to have stopped breathing. So quickly that we could hardly see what was happening, Lister had seized the astonished house-surgeon by the wrist, and the lint went flying away; at the same instant we saw the patient's lower jaw extended and his tongue hanging out over it with a pair of clipped forceps attached. Colour came slowly to the patient's face, and respiration could be seen. Lister gave a great sigh, and then, with that charming manner and sweet smile so characteristic of his fine face, he apologized to his house-surgeon for his apparent rudeness, saying, "The condition of the poor man demanded prompt action." Then he turned, and, facing a full theatre, said:

"Gentlemen, the method I consider to be the safest for administering chloroform is to pucker the pointed ends of a starched towel, or napkin, by passing a safety-pin through, and holding this well above the patient's nostrils and mouth in such a way that with each inhalation he obtains a free mixture of air during the whole time of administration. By observing this you will not require any form of apparatus, and the method is safe and simple."

I made a note of this at the time, and I now sometimes wonder, on so frequently reading of deaths under chloroform, whether the old teaching is still observed.—I am, etc.,

Birmingham, July 2nd. J. B. MARTIN KENNEDY.

THE DIAGNOSIS OF SMALL-POX AND CHICKEN-POX.

SIR,—In the BRITISH MEDICAL JOURNAL of December 23rd, 1922 (page 1228), Dr. McConnel Wanklyn writes a very useful paper on the differential diagnosis between chicken-pox and small-pox. I presume he refers to modified small-pox—that is, occurring after vaccination—because it is usually in such cases the difficulty of diagnosis arises. Having suffered from small-pox personally, and after recovery seen a great number of cases in Dublin during my student days, I am able to confirm what Dr. Wanklyn says of the two eruptive diseases. There are two outstanding features which can be relied upon to assist in diagnosis. First, in variola the preliminary sickness is very marked and distressing, whilst in varicella it is not nearly so severe; and secondly, the path of invasion is generally quite evident and distinct. In small-pox the eruption is usually first observed on the extremities. The back of wrists and the forehead are two of the most favourite positions for the pimples or pustules to first appear, whilst in chicken-pox the chest, shoulders, and abdomen are the localities of selection for the eruption. In small-pox unmodified by previous vaccination there is

usually little room for doubt owing to the severity of preliminary symptoms of lassitude, fever, pain in the back, and the general aspect of serious illness. Then the eruption is very profuse, associated with a disagreeable odour from the person of the patient. It is of very great importance for young medical men who have not seen or studied the difference between these two diseases to be aware of these points of difference, for I know in Australia many large passenger steamers have been delayed at the quarantine stations owing to lack of knowledge of the ship's surgeon on these points, causing great expense and delay.—I am, etc.,

Collie, West Australia, May 5th. J. DE B. GRIFFITH, M.D.

VACCINE TREATMENT OF TUBERCULOSIS BY A NEW METHOD.

SIR,—Professor Dreyer's research on the "defatting" of the tubercle bacillus is of great interest to me, since his work is in several respects an important confirmation of a part of my researches on the splitting of germs and their detoxication (vide Medical Society of London, February, 1919; *Lancet*, June 28th, 1919; *Journal of State Medicine*, 1921; *Lancet*, April 16th and 23rd, 1921; *British Journal of Tuberculosis*, January, 1922; BRITISH MEDICAL JOURNAL, May 20th, 1922).

In my detoxication process the germs are split up into their various fractions, in order that the bad or useless components may be discarded and only the good antigenic components retained. In 1918-19 I proved by a long series of complement fixation tests that my splitting process did not injure the antigenic properties of the protein or alkali-soluble fraction of the germs, and I further proved that large doses of this non-toxic protein fraction gave much better antibody response than small doses of the ordinary toxic germs themselves. It was found also that detoxicated typhoid bacillus protein produced agglutinins when injected into human persons. I pointed out that the Gram-negative germs were much more easy to split up than the Gram-positive variety, and that the tubercle bacillus was the most difficult of all to fractionize on account of its high lipoid content. I further enunciated the law that the solubility of germs in alkali was inversely proportional to their lipoid content.

My original detoxicated vaccines contained only the protein- or alkali-soluble fraction of the germs and were free from the lipoid and wax which are completely insoluble in alkali. These non-toxic protein vaccines, comprising all varieties of pathogenic germs and including detoxicated tubercle bacillus vaccine (fat-free), were used extensively by many medical men for two years between 1919 and 1921, and in most instances excellent reports were received but were not published, so far as I am aware.

After 1921, due to further extensive researches on the splitting of germs and the study of the antigenic properties of the various fractions, it was decided to include the acid-soluble component and alcohol-soluble lipoid fraction, since they were apparently also antigenic.

Samples of the new detoxicated tubercle vaccine, including the alcohol-soluble lipoid and the chloroform-soluble waxy acid-fast fraction, were sent to Mr. Fraser, F.R.C.S., at the Sick Children's Hospital in Edinburgh to try out in cases of tuberculous children. After a fairly extensive trial he decided to abandon it because in many instances nodules were produced at the site of the injections. Investigation showed that these nodules were due to the acid-fast waxy fraction, and since that time this chloroform-soluble fraction has been discarded, with the result that nodules are now seldom produced. Occasionally, however, when large doses are reached a small hard lump may still be produced at the site of injection, and it is just possible that this is due to the alcohol-soluble lipoid fraction. Again, after an extensive trial at the Edinburgh Royal Infirmary, over a period of three years, Mr. David Lees, F.R.C.S., has concluded that the original detoxicated gonococcal vaccine containing only the protein fraction, and therefore "defatted" so to speak, is as good if not better than the later variety which contained the lipoids as well. In order to decide this vexed question I have also made during the past three years extensive investigations into the literature dealing with the antigenic nature of the lipoids and other fractions of germs. The evidence is somewhat contradictory; for instance, Small (1918) found that the efficiency of bacterial antigen was raised by the removal of the chloroform-ether soluble constituents of the dried bacteria. Many workers, on the other hand, have brought forth evidence to show that the lipoids and even the waxes are antigenic. After weighing up the whole evidence, however, and more especially on account of the observations of Mr. Lees and Mr. Fraser, I had decided to discard the lipoidal fractions from the vaccines, or, in other words, to return to my original type of detoxicated vaccine of 1919-21—namely, that containing the protein fraction only and free from the lipoids and waxes.

Early in 1922 a new development in the splitting up of germs into their component substances was introduced by the invention of a germ-smashing machine which has been in constant use in the Pickett-Thomson Research Laboratory for the past year with great success. By its mechanical smashing action it enables one to disintegrate germs into their component fractions by means of the weakest of chemicals.

If tubercle bacilli are mixed with a solution of twice normal alkali and smashed in this machine for two hours at room temperature they are completely defatted and rendered non-acid-fast. (The protein fraction is dissolved in the alkali and is completely separated by porcelain filtration from the lipoid and wax which are insoluble in the alkali.) In other words, with the aid of the machine the same result can be obtained in two hours with twice normal alkali as was previously obtained with the drastic chemical action of antiformin for a period of three days. With many other varieties of germs one-tenth normal alkali acting for half an hour is sufficient with the aid of this machine.

During the past five years my brother, Dr. Robert Thomson, and myself have split up into their various components and removed the toxic fraction from sixteen litres, or about thirty-five pounds' weight, of solid pathogenic germs of every variety, and I can only conclude from my own endeavours that Professor Dreyer's process of "defatting" or splitting away the lipoid fraction is exceedingly crude. It is surprising to me that a germ can withstand his process of four hours' boiling in formalin at 100° C. and twenty-four hours' boiling in acetone at 65° to 70° C. and still retain its antigenic properties, since my own experiments showed that the boiling of gonococcus protein antigen in neutral saline for half an hour largely destroyed its antigenic value.

My chief anxiety for the past four years has been to split up germs by almost purely mechanical methods, since certain bacteriologists have stated that my detoxication process destroys the antigenic value of my vaccine fractions. However, it is a great comfort to me to think that Professor Dreyer's experiments have proved that the antigenic properties are still largely intact after even his drastic procedure.—I am, etc.,

Pickett-Thomson Research Laboratory, St. Paul's Hospital, London, W.C.2, June 25th. DAVID THOMSON.

WHAT IS A "DISEASED" TONSIL?

SIR,—Is it as impractical and futile to try and define a "diseased" tonsil as Mr. Tilley (June 16th, p. 1038) and Dr. Cavenagh (June 23rd, p. 1075) seem to suggest? Not to do so is to confess our ignorance, yet it is a point of real practical importance. We all recognize the grossly diseased tonsils such as those described in the letters on this subject, but there are many cases in which the evidence of disease is not so convincing. I am frequently asked by colleagues on the medical side to see cases of endocarditis, nephritis, arthritis, eczema, etc., and to report on the condition of the tonsils. Only too frequently I find they are exactly like those of anyone else who is

not suffering from any of these complaints, and to pronounce a verdict on them is very difficult. It is easy to say they should be enucleated, but to do so in every case must eventually bring discredit on the operation and the operator. I entirely agree with Mr. Tilley's statement that "it is impossible by mere inspection to say whether a tonsil is healthy or diseased." I hope the time will come when this assertion will be inaccurate. From certain passages in Dr. Poynton's lecture, I rather assumed that he considered it was possible, and it was more particularly to elicit this information that I raised the question.

The presence of enlarged lymphatic glands at the angle of the jaw is a very valuable sign, but there are many cases of obviously diseased tonsils where they are not palpable.

Dr. Cavenagh asks, "If 'pus' is not a sign of disease [in the tonsil] why should it be considered so in tooth sockets or accessory sinuses?" Surely there is no analogy. The more I study this subject, especially the transatlantic and Continental literature, the more convinced I become that the tonsils have a definite function to perform in resisting systemic invasion and in building up immunity. Professor Digby, whose researches, perhaps, are not so well known as they should be, describes in his letter in the JOURNAL of June 23rd (p. 1075) how he considers they do this. In his own words: "The lymphocytes in the tonsil are continually migrating through the epithelium, phagocyting the bacteria in the crypts, and returning into the lymph nodules." In his book *Immunity in Health* he says: "Lymphocytes found astray in the lumen . . . are the few which have failed to wander back into the lymphoid tissue." We have therefore a fluid normally in the crypts which consists of micro-organisms, lymphocytes, shed epithelial cells, and mucus—clinically very like pus, but as it is formed by the tonsil in the exercise of its function, surely it is more physiological than pathological (a very different thing from pus in a tooth socket or accessory sinus, neither of which are lymphoid structures). The real practical difficulty is to distinguish between this physiological fluid (which has been mistaken for pus) and pus. If these findings are accepted the question of what is a diseased tonsil becomes very difficult to answer. In the present state of our knowledge, I think, only a physician can answer it if, after a thorough examination of all the systems of the patient, he finds evidence of systemic invasion, which is likely to have occurred through the tonsil.

The correspondence, to my mind, clearly shows that the problem has never been really tackled and that we have still much to learn.—I am, etc.,

Norwich, June 25th. N. STUART CARRUTHERS.

THE EDUCATION OF MYOPES.

SIR,—The statement by Dr. Edridge-Green (June 30th, p. 1115) that "myopia is caused by distension of the eye due to back pressure through the veins, such as is caused by lifting a heavy weight," probably contains an element of truth, as my experience as oculist attached to medical boards during the war coincides with his in finding many cases of high myopia in farm servants, who are far from literary in their tastes.

That it does not state the whole truth is demonstrated by the case of a schoolgirl, aged 12, examined by me at Alford this year for the Aberdeenshire Education Authority. Under atropine her refraction was: Right eye −20 D.=6/18; left eye +1 D.=6/6. The fundus of the myopic eye was practically normal, with a very small crescent and no other lesion. Cases of anisometropia frequently repeat themselves in various members of a family; the same sort of astigmatism with the same axis may occasionally behave in a similar fashion. There is no doubt that heredity plays a very important part in the production of refractive errors. Nevertheless, careful correction and supervision of the education of a young myope is essential.—I am, etc.,

Aberdeen, June 30th. A. RUDOLF GALLOWAY.

PROPOSED RONALD ROSS CLINIC.

SIR,—Your leading article and the recent letter in the *Times* concerning the proposal to establish in honour of Sir Ronald Ross a "Ronald Ross Clinic" leads me to write to you.

Sir Ronald Ross, whom I have had the great pleasure of knowing for many years, is deserving of the highest honour and recognition for the work so patiently pursued under difficulties, disappointments, and discouragements, to such a successful end. But may I venture to ask professional and informed opinion whether a clinic in a temperate climate is the proper place for research in tropical diseases, and whether the fund now proposed to be raised would not be much more advantageously expended in establishing one in a tropical country—India, for instance, where Sir Ronald Ross laid the foundations of his great work—or, perhaps, in endowing periodical expeditions to the tropics for the investigation on the spot of particular diseases or local forms of disease.

I make these suggestions with some hesitation, being only a layman who has been keenly interested for many years in the work of schools of tropical disease, and particularly in the establishment of the Sir Alfred Jones Laboratories at Sierra Leone.—I am, etc.,

Liverpool, June 29th. J. PICKERING JONES.

FREEDOM OF NEGRO RACES FROM CANCER.

SIR,—Will you allow me to add the results of my own inquiries to Dr. F. P. Fouché's statement of the freedom of the South African native races from malignant disease (June 30th, p. 1116)?

Thirty years ago I was interested in the causation of cancer, when my friend, the late Sir Henry Morton Stanley, the African explorer, drew my attention to the fact he had observed, that the native races in the regions through which he had travelled were free from it. To make sure, he furnished me with a list of hospitals and got me to write to the physicians in charge of them. The replies I received confirmed his observation and revealed that only in coast towns, where natives mingled with Europeans, did cancer occur, and then only (at that time) one case in about ten or twelve years.

This information led me to further inquiries, and I ascertained that native races of other continents were similarly immune when not brought in contact with civilization. I also noted the belief of several of my correspondents that it was the vegetarian diet of the natives which accounted for the exemption.—I am, etc.,

London, W.1, June 29th. BERNARD HOLLANDER.

HERPES ZOSTER WITH LOCALIZED MUSCULAR PARALYSIS.

SIR,—I am indebted to Dr. Parkes Weber (June 23rd, p. 1075), whose knowledge of the literature of the rare manifestations of disease is unrivalled, for drawing attention to further references dealing with herpes zoster complicated by localized paralysis. In my paper, however, I commented upon the extreme rarity of cases of muscular paralysis in the affected zone accompanying or following herpes zoster of the *trunk*, and stated that I had found very few recorded cases.

By "herpes zoster of the trunk" I implied herpes due to involvement of any of the spinal ganglia between and including the second thoracic and twelfth thoracic segments, and used the term "trunk" as distinct from "limbs." I gave the few references to cases of paralysis of thoracic and abdominal muscles following herpes in the affected zone that I had been able to find, and also mentioned Ebstein's series of twenty cases of paralysis complicating herpes zoster, which included no case of paralysis of thoracic or abdominal muscles, merely to emphasize the rarity of the latter distribution. I made no attempt whatever to deal with the literature of paralysis of the limbs or shoulder-girdle muscles complicating herpes zoster, which I mentioned as being relatively more frequent owing to the closer association of the anterior and posterior spinal nerve roots in the lower cervical region than in the thoracic region.

The case which Dr. Parkes Weber recorded in 1915 was a brachial paralysis, and the nine references he gives all concern paralysis of muscles supplied from the spinal roots concerned in the formation of the brachial plexus—namely, paralyses of muscles of the upper extremity and shoulder girdle. I myself have met with two such examples, and it was my intention to deal with this form of paralysis in a subsequent communication.—I am, etc.,

London, W., June 24th. C. WORSTER-DROUGHT.

HOUSE DISINFECTION.

SIR,—A recent decision in the King's Bench Division by Mr. Justice McCardie on the need for house disinfection as an important factor in the control of tuberculosis raises issues regarding infectious disease and disinfection alike important to the practitioner of curative and of preventive medicine.

In their relation to disinfection, infectious diseases may be regarded as constituting three groups. The first group would include the majority of common infections—scarlet fever, measles, whooping cough, cerebro-spinal fever, and typhoid, from all of which infection is spread either from actual cases of the disease or from carriers, the infectivity of contacts being in all probability due to whether or not they happen to be carriers of the infection. The liability for fomites in this group to play the important part attributed to them in the past has less significance in the light of the carrier problem, and as a result the practice of home disinfection by chemical means after scarlet fever or diphtheria has now been largely given up as redundant by many medical officers of health. Chemical disinfection of an inhabited house fails therefore to control the spread of the above series of infections for two reasons: first, because no effect is produced upon carriers, who are mainly responsible for dissemination of the infection; and, secondly, because satisfactory disinfection of an inhabited house is in many cases wellnigh impossible without resorting to almost impracticable measures to ensure chemical cleanliness. Equal benefit has in these infections been found to result from disinfection of the fomites of the actual case, together with house cleansing, apart from any further attempts at disinfection by chemical means of the premises during occupancy.

In the next group the carrier is an invertebrate, actual cases of the disease apart from the carrier being non-infectious, as for example in typhus fever. Other examples might be quoted, such as trench fever and relapsing fever, both of which, like typhus, are due to infection spread through the common louse. Disinfestation and delousing are, therefore, of importance in controlling the dissemination of such diseases, destruction of the carrier being the most important part of the task of prevention.

A third group would be represented by tuberculosis disseminated in the pulmonary type, through infected sputum, whether recently exhaled or in dry dust months after its extrusion. In the case of tuberculosis, with its absence of carriers, home disinfection can, with proper precautions, be carried out either after the removal of an infective case from his former surroundings, or, with greater satisfaction, should be enforced as a valuable public health measure, compulsorily, if necessary, when the premises are vacated. The ideal time to disinfect a house is on vacation, a fact that might well be considered by owners a matter of self-protection, before re-letting, in any case where a previous tenant is known to have had infectious disease in his household.

Apart from personal fomites care need only therefore be directed to the acquisition of ordinary domestic cleanliness and supervision of contacts in the first group, delousing of contacts and disinfestation of premises in the second, whilst in the third domestic and chemical cleanliness should be carried out as effectively as possible, the absence of a carrier in tuberculosis being obviously an additional asset in the more effective control of this disease, by disinfection.—I am, etc.,

Croydon, June 26th. K. SIMPSON, M.D., D.P.H.

Obituary.

SIR JAMES REID, BT., G.C.V.O., K.C.B., LL.D., F.R.C.P.,

Physician-in-Ordinary to the King.

WE regret to record the death, on June 28th, at the age of 73, of Sir James Reid, Bt., G.C.V.O., K.C.B., Physician-in-Ordinary successively to Queen Victoria, King Edward VII, and King George.

James Reid, son of Dr. James Reid of Ellon, Aberdeenshire, was born in 1849, and was educated at the Grammar School of Aberdeen and then at the University of that city, where he graduated M.A. in 1869 with honours in natural science and a gold medal. He took the degrees of M.B. and C.M. three years later with highest honours, and the M.D. in 1875. He practised in London for two years, and then was in Vienna in 1876 and 1877 for post-graduate study. Returning home, he settled down in general practice at Ellon, and in 1881 he was introduced into Court circles by being given temporary charge of the Royal household at Balmoral during the illness of Dr. William Marshall, who had been resident physician to Queen Victoria for several years. When it was seen that Dr. Marshall would be unable to take up his duties again, Dr. Reid was appointed in his stead and moved with the Court to London.

At first he acted under the supervision of Sir William Jenner, who for years paid a weekly visit to Queen Victoria except when the Court was in Scotland or abroad. Reid was undoubtedly an able and tactful man, and he soon gained the full confidence and respect of Sir William Jenner as well as of his patients. He proved very successful in what must have been a difficult position, and in 1887 was appointed Physician Extraordinary to the Queen. Sir William Jenner's health broke down about this time, and in 1889 Dr. Reid became in title, as well as in fact, Physician-in-Ordinary to Her Majesty. His duties at the Court occupied him fully, and as he was constantly in residence there he engaged in no other practice. The Queen thought very highly of Reid, and was accustomed to seek his advice in many matters not connected with medicine. She made him a C.B. in 1889, K.C.B. in 1895, and a baronet in 1897; in 1901 he was made G.C.V.O. A few years before her death the Queen bestowed on him a house within the precincts of Windsor Castle. After her death Reid continued as a Court physician, but the late Sir Francis Laking was rather the personal medical attendant of King Edward VII, and Reid took a house in London. He relieved Laking at times, attending often on Continental visits, and also taking part charge when the King was ill at home. In 1901 he was appointed Physician-in-Ordinary to the Prince of Wales, and on King George V's accession (1910) he was continued in that office.

While Sir James Reid was physician to Queen Victoria he resided always with the Court and was but little known to the medical profession, but after her death he lived in London and mixed more with his professional brethren, who were able to judge of his personal character and medical capacity, and formed high opinions of both. Reid became a Member of the Royal College of Physicians in 1887, and a Fellow in 1892. He was consulting physician to the King Edward VII Sanatorium, Midhurst. He received many decorations from the various Courts which he visited with Royal patients.

He married in 1899 the Hon. Susan Baring, daughter of Baron Revelstoke, one of the Maids of Honour to Queen Victoria, and leaves two sons and two daughters. His eldest son and successor was a Page of Honour to King George, and distinguished himself at Cambridge, obtaining a first class in the classical tripos, Part II, last year.

A memorial service was held on July 3rd at the Chapel Royal, St. James's Palace, when the Archbishop of Canterbury officiated. A large congregation was present, including representatives of the King and Queen and other members of the Royal Family.

SIR BENJAMIN SIMPSON, K.C.I.E.,

Surgeon-General, I.M.S. (ret.).

SIR BENJAMIN SIMPSON, K.C.I.E., Bengal Medical Service (retired), died in London on June 27th, at the great age of 92. Since the death of Deputy Surgeon-General Parke, on April 10th, 1920, he had been the senior officer on the retired list of the I.M.S. That somewhat doubtful honour now falls to the lot of Deputy Surgeon-General Clarence Cooper, of the Madras Service, who, though just one month junior to Simpson, was actually eight months older.

Benjamin Simpson was born at Clontarf, Dublin, on March 31st, 1831; he was the son of Robert Simpson, solicitor, and was educated at Trinity College, Dublin, where he graduated M.A.; he took the M.R.C.S. in 1852, and the M.D.St. Andrews in 1853. He joined the I.M.S. as Assistant Surgeon on October 20th, 1853, nearly seventy years ago, reached the administrative grade on March 21st, 1882, became Surgeon-General and head of the service on March 20th, 1885, and retired on March 29th, 1890. Though in India at the time of the Mutiny, he did not see service in that campaign. In 1860 he entered civil employ in Bengal, and in 1863 was posted to the medical charge of the mission sent to Bhutan in that year, subsequently serving in the Bhutan campaign of 1865-66, for which he received the frontier medal with a clasp. In 1867-68 he was on special duty on the North-East Frontier of India, and in the latter year was appointed civil surgeon of Darjiling. In 1871 he was transferred to Patna, and in the same year served on the Cinchona Commission. In 1878 he was appointed to accompany the late Maharaja of Kuch Bihar, father of the present ruler, as his guardian, on the first of his many visits to India. In 1881 he was promoted to act in the administrative grade as Deputy Surgeon-General of the Army in Southern Afghanistan, and in the same year was posted as Principal Medical Officer of the Quetta Division. On March 21st, 1882, he was confirmed in the administrative rank, and appointed Deputy Surgeon-General and Sanitary Commissioner of the Central Provinces; subsequently he acted for some time as Surgeon-General of the Punjab and of Bengal successively. On March 20th, 1885, he succeeded the late Dr. J. M. Cuningham as Surgeon-General and Sanitary Commissioner with the Government of India, the title then held by the head of the Indian Medical Service.

On December 20th, 1885, he was granted a good service pension, and on February 15th, 1887, he was created K.C.I.E., being one of the first batch of knights appointed to the Order of the Indian Empire. In 1859 he married Jane, daughter of Brigadier-General Hugh Sibbald, C.B., by whom he had two sons and one daughter, the latter the wife of Brigadier-General Sir A. G. Balfour.

His two chief pursuits in India were big game shooting and photography, and in both he was very successful, attaining considerable skill in the latter when it was a much more difficult art than it is nowadays. When he was Surgeon-General he had rather the reputation of being more intent on his amusements than on his work. The writer of this note, however, was told by a distinguished officer of the Indian Medical Service, who served as secretary to several Surgeons-General, and later himself became Surgeon-General, that Simpson did more work than any other chief under whom he had served. He was a man of the old Anglo-Indian school, who rose very early and got through a great deal of work before breakfast; he had the faculty of knowing just what work he could safely leave to his assistants and subordinates, and he did not himself do work which it was their duty to do—consequently he was free from the cares of his office at an hour when most men were still hard at work. As Surgeon-General he was a strong man, and he raked out of the hands of the Provincial Governments into those of the Government of India—that is, practically into his own hands—a good deal of patronage. Two instances were that in his tenure of office the Government of India took over from Provincial Governments the right of nominating individual officers for civil employ, and the power of appointment to the professorships in the various medical colleges in India. When the question whether medical officers in civil employ should be eligible for military promotion was considered, the Government decided that they should, giving as two instances of conspicuous success on the part of officers promoted from civil posts to act as military administrative medical officers Sir Benjamin Simpson and the late Deputy Surgeon-General Sir James Thornton, both of whom were civil surgeons in Bengal before their promotion.

HUGH CLAYTON FOX, F.R.C.S.I.,

London.

MANY will learn with sorrow and surprise of the death, from angina pectoris, of Mr. Clayton Fox, on June 13th, after scarcely more than one day's illness. He presented the appearance of perfect health and vigour, and those who saw him a day or two before his death would have prophesied for him a prolonged life of activity.

He was born in 1864 at Coddenham in Suffolk, and was educated at Needham Market Grammar School. He studied medicine at the Middlesex and Charing Cross Hospitals and ultimately in Dublin, taking the M.R.S.C.Eng. in 1888, and the F.R.C.S.I. in 1901. After an experience of general practice he studied oto-laryngology at the Central London Throat and Ear Hospital and joined the staff of the Metropolitan Ear, Nose and Throat Hospital. He devoted much time to the work of the throat departments of the Brompton Hospital and the West End Hospital for Nervous Diseases. During the war he acted as assistant and deputy (for Sir James Dundas-Grant) at the King George Hospital, as well as at the Endsleigh and Vincent Square Hospitals for Officers.

The Ministry of Pensions afforded him great scope at the aural clinics at Queen Mary's Hospital, Ducane Road Military Hospital, and for the last few years three aural clinics a week at Hammersmith Broadway. Moreover, he was constantly employed on aural boards. Just before his death he had been appointed aurist and laryngologist to the Marylebone General Dispensary.

He made a masterly translation from the French of Laurens's *Oto-Rhino-Laryngology*, which has been in such demand as to call for two new editions in a comparatively short time. His abstracts from French special journals which appeared in the *Journal of Laryngology* were always accurate and practical. Though of a somewhat reserved disposition he acquired a large number of friends, who became more and more attached to him as they learnt to realize the largeness of his heart.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT a congregation held on June 28th the degree of Bachelor of Medicine was conferred on E. F. Chapman.

The following candidates have been approved at the examinations indicated:

FINAL M.B.—(*Materia Medica and Pharmacology*): G. R. P. Aldred-Brown, E. N. Allott, L. J. Barford, L. W. H. Bertie, R. B. Bourdillon, V. H. Brink, C. S. Broadbent, T. A. J. M. Dodd, L. O. F. Fysh, S. Harris, T. B. Hodgson, A. Kendrew, R. Lewthwaite, P. Morton, E. L. Newell, W. D. B. Read, T. E. Ryves, B. G. Scholefield, B. W. A. Simmons, R. A. Walsh, A. Q. Wells, Evelyn C. Whitehall-Cooke, D. O. Williams, Rosa S. Wordsworth. (*Pathology*): M. McC. Baird, R. E. D. Cargill, C. W. Carter, T. A. J. M. Dodd, C. L. Elgood, K. J. Franklin, D. R. Gawler, C. A. H. Green, H. E. Harding, J. R. B. Hern, J. A. Macfadyen, V. P. Robinson, J. P. Shaw, I. M. Sidley, H. N. Stokoe, J. G. S. Thomas, B. E. Tompson, G. P. Wright, Mathilde E. F. Bugnion, Janet M. Vaughan. (*Forensic Medicine and Public Health*): O. D. Ballinger, D. T. Barnes, E. F. Chapman, A. M. Cooke, R. S. Creed, R. van B. Emmons, J. A. Macfadyen, G. F. L. Mitcheson, E. B. Strauss, T. S. Townsend, H. F. Turner, Cicely D. Williams. (*Medicine, Surgery, Midwifery*): J. W. Alden, P. W. Boobbyer, T. A. Brown, A. D. Dyson, R. van B. Emmons, B. V. Facey, H. C. Hill, J. P. Shaw, A. L. B. Stevens, E. H. Watkins, A. Q. Wells, C. R. Young, W. A. Young, Sibyl R. Eastwood, Cicely D. Williams.

M.CH.—C. H. Carlton.

UNIVERSITY OF SHEFFIELD.

THE following candidates have been approved at the examinations indicated:

M.D.—R. Platt.

FINAL M.B., CH.B.—O. H. Billington, R. L. Brown, Alice C. Caiger, Ida Coates, H. Cretney, A. S. Drummond, C. S. Dunbar, D. Guest (Second Class Honours), W. H. Harding, Mona E. Hatherley, A. B. Nutt, Muriel R. Powell, J. E. Schofield, Annie D. Sykes.

UNIVERSITY OF DURHAM.

A CONVOCATION was held in the Castle Hall on June 26th, when a number of honorary degrees were conferred.

As recorded elsewhere, the honorary degree of D.C.L. was conferred upon Sir Anthony Bowlby.

The following medical degrees were also conferred:

M.D.—N. R. Beattie, D. G. P. Bell, O. Collville, S. W. Davidson, C. N. Gover.
M.D. (*Practitioners*).—W. H. Bennett, Philip Gosse, W. L. Hodge.
M.S.—R. Nicholson.
M.B., B.S.—R. Armstrong, Helen Austin, Monica F. Bell, W. A. Brown, Katherine M. Cellan-Jones, G. A. Fothergill, Irene B. M. Green, Phillis Hall, R. E. Haswell, Gwendolen M. Hunton, B. R. Isaacs, E. H. Jaques, I. M. McLachlan, J. E. D. Miller, L. Minski, Doris H. Motyer, F. G. Mundell, G. C. Parkin, Georgena L. Philipson, H. N. Popham, G. C. E. Reffell, L. F. Richmond, H. C. Rollin, Evelyn M. Scott, W. F. O. Taylor, A. Todd, Kathleen Shelton, P. J. G. de Vos, H. A. Wallace, and A. J. Watson.
B.HY. AND D.P.H.—N. R. Beattie.

Dr. R. A. Bolam was nominated for election by convocation as a member of the Senate for the ensuing period of four years.

UNIVERSITY OF GLASGOW.

THE following medical degrees were conferred on June 20th:

M.B., CH.B.—Grace F. Macpherson, Ian Macpherson, Ethel M. Oastler, W. Simpson.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

As announced last week, the Honorary Fellowship of the College was conferred on June 25th on Sir Harold Stiles, Regius Professor of Clinical Surgery in the University of Edinburgh. In introducing Sir Harold Stiles, the Vice-President of the College, Mr. Charles B. Maunsell, said that he was worthy of the highest honour, as he was one who had worked unceasingly to advance the science and art of surgery. The highest honour which they could bestow was the Honorary Fellowship of their ancient College. On the roll of Honorary Fellows were the names of such world-renowned workers as Erichsen, Hunter, Huxley, Lister, Paget, Pasteur, and the brothers Mayo, and Sir Harold Stiles was worthy to have his name enrolled amongst such immortals. His first work was a translation of that wonderful textbook of operative surgery which was written by the late Theodore Kocher of Berne. Afterwards he collaborated with the Irish students' old friend and teacher, the late Professor D. J. Cunningham, in the production of his *Textbook of Anatomy*. This work was followed by an original and painstaking study, the results of which were given to the world in Burghard's *System of Operative Surgery* and in the *Encyclopaedia Medica*. From these foundations Sir Harold Stiles built higher and higher, always with the same results—the saving of life, the relief of pain, and the advance of knowledge.

Sir William I. de C. Wheeler, President of the College, then formally admitted Sir Harold as an Honorary Fellow in the words quoted last week (p. 1107).

The Governor-General then, on behalf of the College and country, presented the new Honorary Fellow with the parchment. At the charter day dinner which, as already reported, followed the ceremony, the Governor-General paid a warm tribute to the work which had been done in the world of medical science by Dr. Mayo and his brother, and said that these two men alone had done for surgery in America what had been done nowhere else in the habitable globe. They were proud, too, of their distinguished guest from Edinburgh, a city to which Irishmen owed a great deal, both as regards medicine and surgery. He rejoiced that that great College had once more been able to assemble in jollity and good-fellowship, and was glad to think that their toast would have a speedy re-echo in the speedy prosperity of their beloved country.

The speeches made in connexion with the other toasts were reported last week.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have passed in the subjects indicated:

SURGERY.—L. P. Garrod, B. Hart, *L. K. Htoe, *M. S. Mahmud, B. Teverson.
MEDICINE.—L. P. Garrod, E. W. Hicks, B. Teverson.
FORENSIC MEDICINE.—C. P. Garrod, E. W. Hicks, J. A. H. Sykes, B. Teverson, H. Whitby.
MIDWIFERY.—D. Dimitrijevitch, L. P. Garrod, L. Statnigrosh, B. Teverson.

* Section II.

The diploma of the Society has been granted to Messrs. L. P. Garrod, B. Hart, E. W. Hicks, and B. Teverson.

The Services.

COMMISSIONS IN THE R.A.M.C.

THE War Office announces that an examination for not fewer than twenty commissions in the Royal Army Medical Corps will be held in London on August 1st next, and that those who intend to compete should lodge their applications with the Secretary of the War Office not later than July 20th. The presence of candidates will be required in London from July 30th. A full statement of the duties and emoluments of the service will be furnished to prospective candidates on written application to the Secretary (A.M.D.1), War Office, Whitehall, S.W.1.

FOREIGN DECORATIONS.

THE following are among the decorations and medals awarded by the Allied Powers to British Forces for distinguished service during the war 1914–19.

BY THE KING OF THE BELGIANS.

Croix de Guerre.—Brevet Colonel John T. Clarke, C.B., C.A.M.C., Major T. Morrison, C.A.M.C., Captain A. F. Menzies, M.C., C.A.M.C.

BY THE PRESIDENT OF THE FRENCH REPUBLIC.

Medaille de la Reconnaissance Française (En Argent).—Major Robert C. Hallowes, D.S.O., R.A.M.C.
Medaille des Epidémies (En Vermeil).—Major Jules Lafleur and Captain Joseph H. A. Paquette, No. 8 Canadian General Hospital, C.A.M.C. (*En Argent*).—Captains Clermont Bourget and Raoul Brault, No. 8 Canadian General Hospital, C.A.M.C.

DEATHS IN THE SERVICES.

LIEUT.-COLONEL THOMAS BOYD, R.A.M.C.(ret.), died at Ballina, co. Mayo, on March 31st, aged 71. He was born at Ballina, took the L.R.C.S.I. in 1874, and the L.R.C.P.I. in 1875, entered the army as surgeon on February 4th, 1877, became surgeon lieutenant-colonel after twenty years' service, and retired on February 24th, 1897. After his retirement he was employed for some time in medical charge of the dépôt at Armagh. He served in the Egyptian war of 1882, and was present at the battle of Tel-el-Kebir, receiving the medal with a clasp and the Khedive's bronze star; and in the Sudan in 1884–85, in the Nile expedition, when he was in charge of the field hospital at Absarat, and received a clasp to the Egyptian medal.

Medical News.

A MEMORIAL tablet to the late Dr. John Roberts Thomson, erected in the hall of the Royal Victoria Hospital, Bournemouth, was unveiled on June 26th. The Mayor of Bournemouth, before drawing aside the flag which covered the tablet, spoke of the devoted and self-sacrificing services which Dr. Roberts Thomson had rendered to the town and in particular to the hospitals. He said that no honorary freeman was regarded by the borough with more affectionate regard and the memory of no freeman was more highly revered. Dr. Roberts Thomson was president of the British Medical Association when it held its Annual Meeting at Bournemouth in 1891, and was chairman of the Central Council of the Association from 1899 to 1901.

THE annual meeting of the Medico-Psychological Association of Great Britain and Ireland will be held in London during the second week of July. Dr. Edwin Goodall, medical superintendent of the Cardiff Mental Hospital, will take the chair for the first time as president, and will give an address on the afternoon of Tuesday, July 10th, on "Considerations, bacteriological, toxicological, and haematological, and others therewith associated, bearing upon the psychoses." On the following day, July 11th, a discussion on the relation of chronic sepsis to the so-called functional mental disorders will be introduced by Dr. Henry A. Cotton, medical director, New Jersey State Hospital; in the afternoon a visit will be paid to the Bethlem Royal Hospital, and the annual dinner will take place in the evening. On the afternoon of July 12th a visit will be paid to the Maudsley Hospital. A number of papers will be read on each day of the meeting, which will close on Friday, July 13th.

A PRESIDENT'S gold chain and badge have been presented to the Royal Society of Tropical Medicine and Hygiene by the retiring president, Sir James Cantlie, who was one of its founders. The chain consists of a number of plaques held together by ornamental links. Each plaque bears, or will bear, the name of a former president. The centre link is formed by the initials of the donor surrounded by a laurel wreath. The badge shows a sketch of a mosquito on a shield, with the motto *Zonae torridae tutamen*. The incoming president, Sir Percy Bassett-Smith, K.C.B., F.R.C.P., F.R.C.S., was formally invested with the chain by the retiring president at the last meeting of the Society. The chain was designed and made by the Goldsmiths and Silversmiths Company, London.

THE issue of the *Journal of Tropical Medicine and Hygiene* for June 1st is devoted to tropical skin diseases. It contains papers from contributors in the Sudan, Siam, Calcutta, and the United States, as well as from workers in this country, and is well illustrated. The plates provided for the paper by Dr. Mendelson on the disease hitherto known as juxta-articular nodules, to which he proposes to apply the term "xanthoma tropicum," show conditions which at first glance suggest to the uninstructed either multiple bony lesions or malignant tumours. The nodules seem, in fact, to be fibromatous without any tendency to malignancy, though they may undergo fatty degeneration, and in old cases some calcification and amyloid change. The cause of the disease

has not yet been ascertained. It was first noted in 1897 in New Guinea, but it has been observed also in Siam, Java, Madagascar, in both French and British Guinea, and in Algeria. Drs. Castellani and Tejera describe a skin disease of which we have not previously heard. It occurs in Venezuela, where it is called "cute" and is said to be fairly common. Bright yellow patches with little or no desquamation appear, sometimes in childhood, and very slowly spread. It is thought to be identical with an infection described by Castellani in Ceylon under the name of tinea flava. Spores were observed in scrapings from the yellow patches, but no fungus growth could be obtained from them.

AT the meeting of the Society for the Study of Inebriety to be held at 11, Chandos Street, W.1, on Tuesday, July 10th, at 4 p.m., Professor A. Louise McIlroy will open a discussion on the influence of alcohol and alcoholism upon ante-natal and infant life.

A MEMORIAL to the late Dr. Murdoch Mackenzie was unveiled on June 22nd in the Isle of Lewis Hospital, of which institution he was one of the founders and for twenty-six years its medical superintendent and devoted friend.

THE very fine collection of Hispano-Moresque pottery made by Mr. Francis W. Mark is to be sold at Christie's on July 10th. It contains some rare pharmacy jars of the fifteenth century. Part of the collection was exhibited last summer at the Royal Society of Medicine's social evening.

THE University of London Press announces for early publication an illustrated volume on *The Diseases of the Breast*, by Willmott H. Evans, M.D., F.R.C.S., surgeon to the Royal Free Hospital.

A SECOND (revised and enlarged) edition of Choyce's *System of Surgery*, in three volumes, is announced for early publication by Messrs. Cassell.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocera, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

"G. T." inquires if there is any hospital in the British Isles where a native of Sierra Leone, who is an M.A., B.Sc., and M.B., B.S, could obtain a house-surgeon's appointment. Failing such, could the graduate be attached as a pupil to learn the work of house-surgeon and at the same time obtain an insight into hospital administration?

UNCERTIFIED MIDWIVES.

"OXON." writes: (1) Is a nurse who holds certificates of proficiency in midwifery, but has not passed the examination of the Central Midwives Board, eligible for registration as a midwife? (2) In the event of her being eligible, am I as a doctor permitted to allow her to conduct cases without my actually being present at the confinement?

*** (1) No woman (other than a registered medical practitioner) can act as a midwife in England or Wales unless she holds the Board's certificate. This certificate she can now only obtain by passing the Board's examination or by being enrolled by virtue of holding the certificate of either the Central Midwives Board for Scotland or the Central Midwives Board for Ireland, obtained as a result of training and examination equivalent to the standard adopted by the Board. (2) If a medical practitioner were to allow an uncertified woman to conduct cases without his actually being present at the confinements, the woman would be liable to be prosecuted and the doctor to be reported to the General Medical Council for "covering" an uncertified woman.

INCOME TAX.

"L. B. S." bought a practice as from May 1st, 1921. There appears to be some difficulty in the way of an assessment on the three years' average of his predecessor; "L. B. S." has supplied an account of his cash receipts and expenses to the inspector, who declines to take the receipts on that basis, and claims to add thereto the value of the debts outstanding at the end of the year. He also declines to allow a deduction for removal expenses. The proper basis is of course the average of the three previous year's profits, and if those figures are not available, the profits of the current year are useful only so far as they may serve to indicate what that average probably amounted to, *or*, if the profits have fallen off, as a basis of adjustment to meet that special case. The inspector's point about the necessity for taking bookings into account during the early years holds good; income tax is payable on profits earned and receivable even though they have not in fact been received. The claim to a deduction for removal expenses cannot be upheld as there is judicial authority against it; the expense is not incurred so much in carrying on the practice as in acquiring it.

"H. E. G." replaced a 10-h.p. S. car by a 10-h.p. F. costing £662, the cost of a car of similar make and the same horse-power as the S. is estimated at £600. He has claimed to deduct £600 – £100 allowed for the old car, net £500. The inspector of taxes says he is not entitled to replacement cost but to depreciation—for example, £220 (cost of old car), less £100—that is, £120 only.

*** It is beyond dispute that a professional man is entitled to cost of replacement and not to depreciation—which in the long run would be of greater benefit. In the official evidence given before the Royal Commission on the Income Tax it was stated that the cost of replacement would be measured by the expense necessary to replace a machine, and that where that amount exceeded the original cost no restriction would be enforced, except that where the expenditure was incurred partly for improvement *the portion* so incurred could not be allowed. Assuming that a 10-h.p. car of similar quality and type to the S would cost £600 when the F. was bought, our correspondent is correct in claiming to deduct £500.

LETTERS, NOTES, ETC.

MESSRS. BOOTS of Nottingham have issued a list of chemicals of guaranteed purity for use in research. The majority of the substances in the list are manufactured by the firm.

CORRECTION.

DR. GORDON NORRIE of Copenhagen calls attention to an error in the annotation on the prevention of ophthalmia neonatorum in Denmark published in the JOURNAL of June 23rd. In the fourth line from the end (p. 1062) is a quotation which should read as follows: "it is impossible by prophylaxis to prevent the infection taking place after birth"—that is, in the days after the birth.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 31, 34, and 35 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 32 and 33.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *12*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page) ...	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, W.C.2, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.